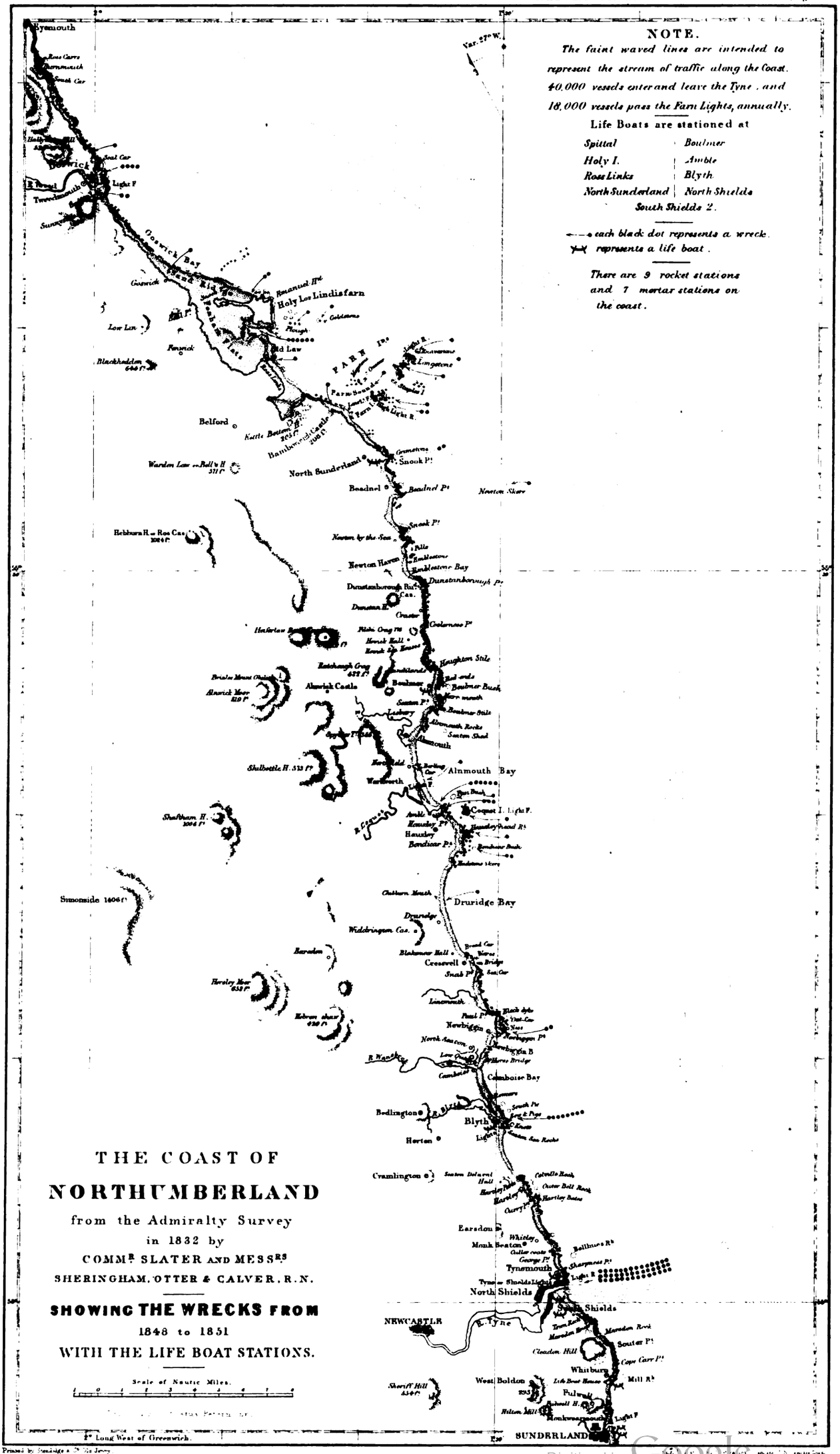
LIFE BOATS.

Presented by the Duke of Northumberland



REPORT OF THE COMMITTEE

APPOINTED TO EXAMINE THE

LIFE-BOAT MODELS

SUBMITTED

TO COMPETE FOR THE PREMIUM

OFFERED BY

HIS GRACE THE DUKE OF NORTHUMBERLAND:

TO WHICH IS ADDED,

A LIST OF THE EXISTING LIFE-BOAT, ROCKET, AND MORTAR STATIONS,

AND AN ABSTRACT OF THE WRECKS WHICH OCCURRED ON THE SHORES OF THE BRITISH ISLES IN 1850.

WITH APPENDIX, MAPS, AND PLANS.

LONDON:
PRINTED BY W. CLOWES & SONS, STAMFORD STREET AND CHARING CROSS.
1851.

CONTENTS.

ILLUSTRATIONS.

To Rear-Admiral His Grace ALGERNON, *Duke of* NORTHUMBERLAND.

My Lord Duke, *Somerset House, London, June* 1, 1851.

In accordance with the request of your Grace, we have examined the several models and plans sent in to compete for the premium offered for the best model of a life-boat, and we have now the honour to submit the following Report as containing the result of our inquiries.

First, however, we may be permitted to offer our congratulations on the liberal manner in which your Grace's offer has been responded to, by boat-builders and others from all parts of the United Kingdom. It is highly honourable to the country that so large a number of individuals should have come forward with suggestions as to the best means of preserving life from shipwreck: many of the plans are ingenious, many of the models prepared at much expense and highly finished; while to many of the exhibitors the reward offered could be no object, and we are fully borne out in believing that their chief motive was the cause of humanity, and the intended benefit of their fellow-creatures.

Before proceeding to state the results to which our inquiry has led, it may be satisfactory to those who have taken a part in the competition briefly to state the mode in which this inquiry was conducted; it may also be useful to refer to the causes that more immediately led to the consideration of the whole subject of the existing means for saving life from shipwreck, and the steps that have been subsequently taken.

In consequence of the accidents that had happened to life-boats around the coasts of Great Britain, and more especially the recent lamentable case off Shields in December, 1849, when, by the upsetting of the life-boat, twenty of the best pilots out of the Tyne were drowned; the failure of the life-boat in many cases in getting off to the wrecked vessel; the defective state of many of the existing life-boats, as at Amble, North Sunderland, Barmouth, Isle of Man, &c.; the absence of efficient life-boats along a great portion of the west coast of England and Wales, and the coasts of Scotland and Ireland; and the want of due reward and encouragement to men going off to wrecks, who often received nothing, or, as in the case at Holy Island, in April, 1850, got 20*d.* a-piece for risking their own lives to save those of others, it was determined to make an effort to remedy some at least of these evils, and the first and most obvious step was to endeavour to introduce an improved life-boat, both in external form and in internal fittings.

A notice to boat-builders was accordingly issued in October last, offering, in the name of your Grace, a reward of One Hundred Guineas for the best model of a life-boat; it pointed out the chief defects in the existing boats, namely, that they had not the power of self-righting; that they did not free themselves quickly of water; that they were too heavy for transporting alongshore, &c.; but in other respects the form, construction, and fittings of the boat were left entirely to the skill and judgment of the builder. The notice was advertised in *The Times*, the *Shipping Gazette*, the *United Service Gazette*, and copied into

several local newspapers; it was also, by permission of the Comptroller-General of the Coast Guard, sent to the several Inspecting-Commanders, and by them distributed to the chief boat-builders around the coasts.

The result of this notice was, that 280 models and plans were sent to Somerset House for competition. On examining the papers it was found that there was a want of exact information on many points, and accordingly a circular naming the several particulars required was sent to each contributor. The answers to these circulars, with the original descriptions, specifications, and plans of the several models make five folio manuscript volumes, containing much useful information on the subject of life-boats, and form a valuable record and work for reference.

A general review of the models soon pointed out that they might be advantageously grouped according to their characteristic features; thus there were several models in the form of pontoons; catamarans or rafts formed a second group; a third group may be described as having for its type a troop-boat or steamer's paddle-box boat; a fourth as partaking chiefly of the north-country coble; and lastly, a group composed of the ordinary boats in every-day use, slightly modified according to the nature of the coast they were intended for.

After examining the models separately, so as to ascertain their form for pulling or sailing, their dimensions, capacity for holding water, area of delivering valves, weight, nature and amount of extra buoyancy, and trying experiments in the Thames on their relative stability, power of self-righting and readiness in freeing themselves; having also prepared a description of several and added a few remarks, each model was brought forward in turn before the General Committee, the description and remarks read over, discussed, corrected, and agreed upon.

The difficulty then arose, where so many boats were nearly alike, of deciding on the relative merits of each. In order to ensure that no good quality should be overlooked, and to obviate the possibility of bias, the Committee agreed upon those points which they considered the essential qualities of a life-boat and their order of precedence. A certain numeral was then given to each of these qualities according to its importance, so that the whole numbers should make up 100. It may be satisfactory to the several competitors to know what, in the opinion of the Committee, are those qualities and the degree of importance they attach to them. They are as follows:—

	Nos.		Nos.
Qualities as a rowing boat in all weathers	20	Suitableness for beaching . . .	4
Qualities as a sailing boat . . .	18	Room for, and power of, carrying passengers	3
Qualities as a sea boat; as stability, safety, buoyancy forward for launching through a surf, &c. . . .	10	Moderate weight for transport along shore	3
		Protection from injury to the bottom .	3
Small internal capacity for water up to the level of the thwarts . . .	9	Ballast, as iron 1, water 2, cork 3 .	3
		Access to stem or stern . . .	3
Means of freeing boat of water readily .	8	Timber heads, for securing warps to .	2
Extra buoyancy; its nature, amount, distribution, and mode of application .	7	Fenders, life-lines, &c. . . .	1
Power of self-righting . . .	6		100

It will be seen by the above formula that the Committee consider it an essential requisite in a life-boat that she should be a good rowing boat, able to get off the beach in any weather in which a boat can live at sea, as without the power of doing this, other good qualities are of no avail. To this, then, is awarded the highest number. As on the coasts of Norfolk and

Suffolk, where the wrecks generally occur on outlying sands, all the life-boats go off under sail, and, as it was evident some of the best models were prepared with this view, it was considered that these also were entitled to be placed on a par with boats built chiefly for pulling; but as rowing is the general rule around the coasts, and sailing the exception, a slight difference was made in favour of the former.

The other qualities speak for themselves and call for no further notice beyond the general remark that the numbers are so distributed that a boat that could neither pull nor sail well, even if she combined all the other essentials of a life-boat, could not by this scheme take a high rank; it being considered that if a builder could construct a boat to combine stability and safety in all weathers at sea, with speed in rowing, he would find no difficulty in applying the internal fittings requisite to render his structure a good life-boat. On the other hand, pulling or sailing well alone would not enable a model to take a high rank; and, in fact, most of the best models combine the qualifications of speed and stability, with good internal fittings.

The above details will appear tedious; but the Committee felt that they had a delicate and responsible task to perform, and they would rather incur the reproach of being wearisome than that the humblest competitor among the number should not be fully aware of the principle that guided them in awarding the premium.

This preliminary formula arranged, all difficulties vanished. Each model was again brought forward in its turn, each quality of it was named and examined in order, the number or proportion of the whole number, according to its merits, was proposed, agreed upon, and set down in a column. After some days, when many models had been examined, these numbers were added up, and the relative order of merit in the several boats established. The six boats that stood first on the list were then, for the third time, brought forward and placed together side by side, their several points again examined, and the models carefully compared with each other; the result was a confirmation of the former numbers. They were found to stand as follows:—

JAMES BEECHING, of Great Yarmouth, 84.

HENRY HINKS, Appledore, Devon	78	J. and E. PELLEW PLENTY, Newbury	77
WILLIAM TEASDEL, Great Yarmouth	75	HARVEY and SON, Halifax, Ipswich	74
GEORGE FARROW, South Shields	72	SEMMENS and THOMAS, Penzance	72
GEORGE PALMER, Nazing Park, Essex	70	WILLEM VAN HOUTEN, Rotterdam	70
ALEXANDER ROBINSON, Hartlepool	70	J. and J. HARDING, Whitby	70
FORREST and LAURIE, Commercial Road	70	THOMAS GAZE, Mundesley	70
WILLIAM GREENER, Aston, Birmingham	70	GEORGE LEE, Tweedmouth, Berwick	68
R. LITTLEJOHN and SON, Spittal, Berwick	67	WILLIAM FALKINGBRIDGE, Whitby	66
JOHN EDMOND, Scarborough	67	THOMAS COSTAIN, Liverpool	65
WILLIAM CAMBRIDGE, Filey, Yorkshire	65	JOSEPH HODGSON, Blyth	65
R. TAYLOR, Newcastle	65	W. GOODRIDGE, Swansea	65
JOHNSTON and HAINES, Brighton	65	JOHN COCKEY, Portsmouth	64
THOS. WAKE and SONS, Sunderland	63	BENJAMIN BIRCH, South Shields	63
JOHN THOMPSON, Rotherhithe	63	J. BERTRAM, East St., Manchester Sq.	63
R. TREDWEN, Padstow	63	ROBERT BLAIR, South Shields	63
C. F. GOWER, Ipswich	63	T. and J. WHITE, Cowes	62
JOHN ARROWSMITH, Gosport	62	CHARLES GURR, Portsea	62
JOSIAH JONES, Liverpool	61	JOHN LISTER, Sunderland	60

We have therefore to declare JAMES BEECHING, of Great Yarmouth, the successful candidate for the premium offered by your Grace for the best model of a life-boat.

It is to be observed that the Committee have come to their decision solely on the models and plans submitted to them. It is quite possible that the builders at the head of the list never built a life-boat, and that some much lower down in the list may have built boats that have been the means of saving hundreds of lives; but it did not appear to the Committee that they had any discretionary power on this point: the same notice was issued to all, and all had the same opportunity of preparing their models; and it is alone upon the models submitted for competition that the decision has been come to, irrespective of any other circumstances.

It will be seen from the drawing in Plate 1, and the description annexed, that the boat which stands at the head of the list would, from her form, both pull and sail well in all weathers; she would have great stability and be a good sea boat; she has moderately small internal capacity for holding water under the level of the thwarts, and ample means for freeing herself readily of any water that might be shipped; she is ballasted by means of water admitted into a well or tank at the bottom after she is afloat; and by means of raised air-cases at the extremities, a light iron keel, and the absence of midship side air-cases, she would right herself in the event of being upset. It will thus be seen that this boat combines most of the qualities required in a life-boat, although there is no doubt that the builder, when he takes the subject more fully into consideration, will be able to effect improvements in some minor points.

Many others of the models have somewhat similar good features. HINKS, of Appledore, has greatly reduced the internal capacity of his boat, which gives him precedence over some otherwise equally good forms. PLENTY, of Newbury, has done the same; he has also shown much skill in the mode of applying cork to the bottom of his boat; two small boats by this builder, one at Appledore, Devon, and the other at Skegness, in Linconshire, have been instrumental in saving 120 lives. HARVEY and SON, of Ipswich, contribute a fine sailing-boat, which has the property of ballasting with water. The model of FORREST and LAURIE, also, has some good points, and takes a fair stand. TEASDEL, of Great Yarmouth, is well known as having built several fine boats stationed at Caistor, Pakefield, and Southwold, on the coasts of Norfolk and Suffolk, which have been the means of saving 72 lives. One excellent feature in his boats is the use of air-cases detached from the side, so that they can be examined and repaired at any time. In point of workmanship and finish, TEASDEL's models are not surpassed by any sent for competition.

COSTAIN, of Liverpool, is also entitled to credit for his detached air-cases, in the form of breakers or small barrels, secured to the side; and for his diagonal mode of building. His boat, from its form, would pull and sail fairly, and have good stability; but it has large internal capacity, no means of freeing itself from water that may be shipped, and would not right in the event of being upset. At the same time it must be remarked that there are nine boats (built on this model, we believe,) stationed at Liverpool; there are also similar boats at Carnarvon, at Anglesea, and Shoreham. The Liverpool life-boats, supported by the Dock Trustees, and under the superintendence of Lieut. LORD, R.N., have been the means of assisting 269 vessels, and saving 1,128 lives during the last eleven years, so that the boats must be fine sea-boats, and, in addition (which has no doubt a great deal to do with it), must be efficiently manned and well managed.

BROMLEY, of Sheerness, has ingeniously filled in the interior of his boat, from the keelson to the flat, with cork and air quartered alternately, thus reducing his internal capacity by a combination of ballast and buoyancy. Lieutenant SHARPE, R.N., proposes to fill the whole of his boat below the thwarts (excepting spaces for the rowers) with cork, so arranged that he can remove pieces of it to make room for passengers, when required. HODGSON of Blyth, and ARROWSMITH of Portsmouth, also fit their boats with cork, so distributed as to greatly reduce internal capacity, and yet to leave ample space for passengers. Unquestionably the use of cork is preferable to air-cases as being less subject to injury, if sufficient buoyancy can be obtained by it. The Committee have set on foot experiments on this point, but their present impression is, that cork is sufficiently light to be used entirely under the flat instead of air-cases for reducing the internal capacity, and at the same time heavy enough to act as ballast instead of water. Whether cork may be substituted for the raised air-cases, required in the extremities and quarters of a boat to give her self-righting power may be a question, but this much is certain, that all that is essential to the buoyancy of a boat may be obtained by cork, a material which is easily procured, economical, and not liable to accidents. Nor is this any new discovery; GREATHEAD'S original life-boat was fitted with cork; and it is well known at Shields that this boat (in taking the crew out of the ship *Grafton*, stranded on Tynemouth Rock Heads, under the Spanish battery, about the year 1820) struck upon a rock, bilged, and swamped; but she still remained upright, and brought both crews safely to land.

The group of life-boats generally, from Shields, the Tyne, Sunderland, and others from Hartlepool and Whitby, may be considered as having for its type a flat-bottomed troop-boat, or steamer's paddle-box boat. The model of GEORGE FARROW, of South Shields, represented in Plate 6, which gained the first premium in a life-boat model competition at South Shields in 1842, and again at Newcastle in 1850, is perhaps a fair specimen of this class. It has small internal capacity, a moderate proportion of delivering area (although not enough), water ballast in the bottom to be admitted when afloat, raised air-cases in the bow and stern-sheets, clear access to the extremities, ample room for carrying passengers, and she would right herself in the event of being upset, all of which are good qualities. TAYLOR, BLAIR, DOWEY, FRY, ANDERSON, BIRCH, ATKINSON, SCOTT, and others of the Tyne; WAKE, LISTER, SANDERSON, HODGSON and others, of Sunderland; FALKINGBRIDGE, SWALLOW, GALE, and others of Whitby; ROBINSON, HALL, DRUERY, and others of Hartlepool; GAZE of Mundesley, ARROWSMITH of Portsmouth, and GREENER of Birmingham, have models constructed on a somewhat similar form. The last-named competitor claims to be the original inventor of the mode of ballasting with water, and states that he submitted a model showing this principle at South Shields in 1842, and again at the competition at Newcastle in the spring of 1850. On this claim for priority, which seems to rest between FARROW and GREENER, the Committee offer no opinion, but may remark that this mode of ballasting (which has the merit of saving the transport of the weight along shore) is common to many of the life-boat models sent from different parts of England. With respect to the form of this class of boats, its advantages, beyond great stability, are not easy to be discovered; if the life-boats were towed out to the site of the wreck by a steam-tug, as at Liverpool, (and which, in a port like Shields abounding with steam-tugs, might have been expected,) it would be easier to understand it; but for a boat that has to pull out of a river, and often against a strong wind and

tide, it is difficult to comprehend why such a form as that given to the Yarmouth boat, Plate 1, should not be preferred. It must, however, be borne in mind that the boats stationed at North and South Shields have done good service, and been instrumental in saving hundreds of lives.

LEE of Tweedmouth, MILBURN of Blyth, and EDMOND of Scarborough have sent life-boats after the model of the north-country coble. The good qualities of the coble on the coasts of Northumberland, Durham, and Yorkshire, when employed as a pilot-boat, or a fishing-boat, and in shallow water, and for landing on, or embarking from, a flat beach in not very stormy weather, are too well known to require remark; but it is doubted whether the form is applicable for the general purposes of a life-boat either on a flat coast or on any other. The low square stern and want of keel on the after body will not admit of running the boat before the wind when blowing hard; and in proof, it may be stated, that in the recent sad accident at Newbiggen some of the cobles went down by the stern, and the very fishermen who invariably use the coble for their own purposes, have expressed a wish to have a life-boat of a whale-boat form. HAWKS, of Robin Hood's Bay, has submitted a model resembling two fore bodies of a coble joined together, which make a fair boat. CAMBRIDGE, of Filey, has contributed a good model, and has built life-boats stationed at Hartlepool and Riga, which it is said have been instrumental in saving 69 lives within the last eight years.

Another class of boats, offering in form a strong contrast to the Shields boats before mentioned, require notice, as they seem to be intended by their builders for contending with rapid tides and smoother water, rather than the ordinary heavy open sea to which life-boats are commonly exposed. Their dimensions are more those of a Deal galley, with breadth about one-fourth their length. The models of Messrs. WHITE, the well-known builders at Cowes, of TREDWEN of Padstow, of SEMMENS and THOMAS of Penzance, of Lieut. SHARPE, R.N., of Hanwell Park, of SPARKE of Exeter, and of BROMLEY of Sheerness, belong to this group. As a rowing-boat in moderate weather, a boat after the model of the Messrs. WHITE would distance many of those sent in for competition; and it is known that in very heavy weather such a boat has been the means of saving life; but if the Committee have formed a right judgment as to the qualities essential in a life-boat, it will be found, on an inspection of the drawing and description of her, that this boat is not adapted for that purpose. As a safety galley for the Coast-guard service, the boat would be a great improvement upon those galleys now in use; and we believe, as such, it has been tried and favourably reported on. The boat of Mr. GEORGE PALMER, of Nazing Park, Essex, is also of this class; it claims attention as being the model which has hitherto been generally adopted by the National Shipwreck Institution; and several similar boats, it is said, are placed around the coasts, as at the Isle of Anglesey and elsewhere.

Among other models submitted for competition, Mr. WILLEM VAN HOUTEN, of Rotterdam, President of the South Holland Shipwreck Institution, has had the courtesy to send a model of the life-boat in use in Holland. It will be seen, from the drawing in Plate 9, and the description of it, that this boat has a flat bottom to suit it to the nature of the coast; it is said to have been the means of saving many lives. FRANCIS, of New York, also sent a model of what he terms the "life surf boat," which has the peculiarity of being made of corrugated galvanized iron. From experiments that have been made, on this boat it appears unsuitable, under its present form, for the general purposes of a life-boat on any part of the coast of this country. We learn from the printed

testimonials which accompany this model, that the Government in the United States have established life-boat stations along the coast of New Jersey at every 10 miles apart, at a cost, for the whole, of 2,000*l.*

In several of the models it is proposed to use paddle-wheels, and in some a screw, as a propeller, to be worked by cranks. BREMNER, of Wick, places his paddle-wheels within what may be considered a double boat. REMINGTON, of Warkworth, boldly proposes the use of steam, and CORYTON of atmospheric air as a moving power. The time may come when steam may be so under control as to be made directly applicable to a life-boat (and in the form of a steam-tug it is already of great use, and might be much more used with advantage), but for the present the Committee do not feel that they should be warranted in recommending any other propeller than oars. With respect to manual labour applied to cranks for moving paddles, no proof has yet been adduced that sufficient power or speed can be obtained by means of it; paddle-wheels would fail also in turning the boat quickly.

The group of models representing pontoons, rafts, or catamarans, comprises a numerous body. RUSSELL and OSWALD, of Douglas, Isle of Man; DOCKAR, of Banff; the Hon. and Rev. A. PERCEVAL of Bookham, GALE of Hull, and others, have shown ingenuity in their models, but they cannot be made applicable to the purposes of a life-boat when required to pull off a lee shore in a gale of wind. Catamarans are much used at Bahia, and at other places on the coast of Brazil, and, it is known that they remain at sea in stormy weather; but that is a very different thing from being so much under control as to be enabled to approach a wreck. The real use of a raft is that, at the last extremity, and when all boats are stove, it can be formed out of the spars on board the stranded vessel, and thus afford the crew a means of escape by driving ashore before the wind and sea; and every sailor should make himself familiar with the simple plans proposed by Capt. BULLOCK, R.N., and others, for readily forming such a raft in time of need.

It is unnecessary to touch further on the peculiar features of the several models. There will be found in the Appendix to this Report a catalogue of every model submitted for competition, giving its principal dimensions and estimated cost of construction, with the name and address of the inventor; there are also more detailed descriptions of about thirty of the models, and drawings of twelve, showing one of each class or group of boats. It might have been more gratifying to each exhibitor to have had his own model described in detail; but it would have caused great repetition, as many are so nearly alike, and it could have been of no public interest or utility. Sufficient boats are described and delineated to enable a boat-builder in any part of the kingdom to make choice of one adapted to his coast, and to build for himself from the lines and sections which are given; or he may select the best points from each and combine them in one boat. Yet further, the Committee considering that the chief object of your Grace was to diffuse correct information, and, as far as possible, guide others, have requested Mr. PEAKE, one of their number, to prepare a drawing showing a plan and sections of a 30-feet boat, in which, profiting by the experience gained in the examination of the models, all the best qualities of a life-boat should be combined. Such a drawing will be found in Plate 13, and the Committee have the gratification to add that the Lords Commissioners of the Admiralty have ordered that a life-boat, according to those lines, should be built in Her Majesty's Dockyard at Woolwich.

One concluding remark on this part of the subject the Committee may be allowed to add, namely, the satisfaction that they have derived from witnessing the number of models sent in by men who are earning their daily bread as working shipwrights or boat-builders in the various private and public dock-yards in different parts of the kingdom. The names of BASTARD, BIRCH, COCKEY, CROAD, DONALDSON, EDWARDS, GRANT, GURR, KEMP, LYON, MAY, MORRIS, SOLE, and WHETTEM, claim mention as such. This fact affords additional evidence that many of the working class are thinking men, and it evinces a desire to improve, which is highly creditable to them.

Although declining to enter into competition for the premium offered by your Grace, Commodore Lord JOHN HAY, C.B., Superintendent of H.M. Dock-yard at Devonport, has sent to the Committee the model of a life-boat. It will be seen from the drawing, Plate 11, and the description given, that this boat would pull moderately well and sail fairly, would free herself from water, would right herself quickly in the event of being upset, but is wanting in stability. The boat is of a peculiar mode of practical building, being constructed of narrow planks, pinned together through the edges, without timbers. It is said to be both durable and economical, and that a boat can be built on this principle at a much less price than that usually charged for life-boats.

Mr. TURNER, Assistant Master Shipwright at Devonport, also submitted the model of a boat which he proposes as a Coast Guard safety galley. Such a boat would pull fast, would free herself of water, would right herself in the event of being upset, but is wanting in stability. The former of these are valuable points in a boat to be employed in a service so exposed to bad weather as that of the Coast Guard, and a boat of this description, with sufficient stability, would be of great use in the Revenue service.

The general opinions of the Committee on the essential points for a life-boat may be gathered from the few remarks that have been already made in noticing the several boats; but having had the advantage of examining the different proposals, it may be useful to state the conclusions at which the Committee have arrived on the several points of form, dimensions, material, internal fittings, &c.:—

1st. With regard to form:—

The form best adapted for the general purposes of a life-boat is that usually given to a whale-boat, that is, both ends alike, but with more breadth of beam; fine lines to enable the boat to pull well, but sufficient fulness forward to give buoyancy for launching through a surf; good sheer of gunwale, say an inch for each foot of length, but rounded off towards the extremes; a long flat floor; sides straight in the fore-and-aft direction; the gunwale strake in the midships to tumble home to protect the thole-pins, and the bow strake to flare out to throw the sea off; as much camber or curvature of keel as can be combined with steady steering and safe launching from a beach, in order that the boat may be turned quickly to meet a heavy roller when about to break on her broadside.

2nd. As regards dimensions:—

In point of length life-boats may be conveniently divided into three classes —from 20 to 25 feet, from 25 to 30 feet, and from 30 to 36 feet—which last may be considered the maximum, and a length rarely required. The smaller-sized boat is handy on those parts of the coast where it is difficult to find a

crew, a difficulty that would be found to extend to a great part of the shores of this kingdom. Such a boat would be easily transported alongshore, easily launched, and readily manned, and, except in some special cases, would generally bring on shore the whole of the crew of a stranded vessel; and as the boat's crew need not consist of more that six men, there would, in case of an accident occurring, be fewer lives perilled. The two boats already alluded to as built by PLENTY, one on the coast of Devon, and the other on the coast of Lincolnshire, are respectively 18 and 24-feet boats, and they have saved 120 lives within the last few years.

The medium, or 30-feet boat, to pull ten oars double banked, is probably the best adapted for the general purposes of a life-boat at all places where a sufficient crew can be readily found to man her. Such boats are in use at Liverpool, Shields, Dundee, and other large ports where no difficulty is experienced in finding a crew, and on a special occasion, at Liverpool, one is said to have brought on shore 60 persons. At less populous places along the coast a 27-feet boat would be found more easily manageable.

The maximum, or 36-feet boat, is adapted for such places as Yarmouth, Lowestoft, Deal, &c., where it is the invariable custom to go off under sail, and where there is never a difficulty in finding beachmen to launch or man the boats, however large. The wrecks at Yarmouth and Deal occur generally on outlying sands, and the boat that happens to be to windward on the coast, according to the direction of the wind, goes off under canvas to the wreck. Thus should a wreck occur on the Yarmouth sands in a south-east gale, the Pakefield or Lowestoft boat would push off, while in a north-east gale, the Caistor or Corton boat would put to sea. The boats actually in use at these places are from 40 feet to 45 feet long; they weigh from four to five tons, and cost from 200*l.* to 250*l.* each. They therefore form the exception to the general rule; but they are powerful boats, are admirably manned and handled, and have been the means of saving some 300 lives within the last 30 years.

With respect to breadth of beam, in a rapid tideway, as the Tay, the Humber, the Bristol Channel, the shores of the Isle of Man, the Shannon, &c., a boat somewhat of the galley form, but with ends like a whale-boat, would be more suitable than a wider boat. In these exceptional cases the breadth of beam might be one-fourth the length, but for a life-boat, where the requirements are, roominess for passengers, width to pull double banked, stability to resist people moving about and occasionally pressing down on one side in rescuing a man from the water, it should never be less than one-fourth. The Tyne boats have a breadth of fully one-third the length, and some more, but such would not seem to be the best proportions; probably as 1 to 3·3, or 9 feet of beam to a length of 30 feet would best suit all the purposes of a life-boat.

As to depth, it seems only necessary to observe, that a boat that has to be launched through the surf on a beach should not be too shallow in the waist. The well-known Masulah or surf-boats at Madras have sides 8 feet deep. This height, however, would not suit a boat that has to pull off a lee-shore against a gale of wind, where the less surface exposed the better. As a general rule the inside depth to the gunwale amidships should be one-third the breadth; this would give a 30 feet boat a whole depth of 3½ feet amidships, and a depth not exceeding 6 feet might be taken at the stem and stern-posts.

The weight suitable to a life-boat does not seem to have received much consideration from our builders, to judge from the difference in existing

boats. Those at Holy Island, at Yarmouth, and Southwold, as before mentioned, with their gear, weigh about five tons, whereas many of the models sent in are said to weigh less than half a ton. The mean between these two extremes will be near the truth. For however desirable lightness is for transport along a beach, a certain weight of boat is necessary to resist the force of the waves and to retain momentum, so as not to risk being driven back by the sea; under which consideration 1 cwt. or 1¼ cwt. for each foot of length would be a fair general rule. The weight of gear would vary from 5 cwt. to 15 cwt., according as it comprises oars, masts, sails, anchor, cable, warps, &c.

Whatever be the length of the boat, care should be taken that the space between the thwarts should not be less than from 28 to 30 inches, as in pulling in a seaway it is impracticable always to keep stroke, and if the thwarts are too close, the loom of one man's oar is liable to strike the back of the man abaft him. This is a common complaint in life-boats. The oars should be short to pull double banked, and of fir, as being lighter, more buoyant, and stiffer than ash, which is too pliant. They should pull with iron thole-pins having rope grummets secured to them, and the pins should be so placed that the boat may be pulled either way, by the men merely turning round on the thwarts.

3rd. As regards Materials:—

Hitherto all our boats have been of wood, but the testimonials in favour of metal boats are very strong. Galvanized iron (if that process prevents oxidization, which does not yet seem to be established) would be the most economical, and the corrugated form of it would give strength. But if metal boats be adopted, copper might be preferred as more durable and more tractable. The boats in which Lieut. Lynch, of the United States navy, descended the rapids of the River Jordan in 1848 were of copper, and that officer reports most favourably of them. It is said that a copper boat is now supplied to every vessel in the United States revenue service, if not to the navy at large. The first cost of such boats might be heavy, but the material would always be of value. In metal boats it is affirmed that the air-tight cases could be more easily built into the boat (if in any case such were admissible), and kept from leaking. About one-tenth of the whole of the models submitted are in favour of the use of iron in boats. The Committee are far from advocating the adoption of metal boats as life-boats, but they would recommend a fair and full trial of them at any convenient opportunity.

In the construction of wood boats, well-seasoned Scotch larch, from its durability and lightness (its specific gravity being little more than double that of cork), would be found the best material, but neither Polish nor Italian larch, should be trusted to. American white cedar is both light and durable. One advantage in having wood boats is that we should have the benefit of the skill of the numerous boat-builders around the coasts, whereas the building of metal boats is confined to a few hands; and there is an advantage in having a boat built by an experienced man, who designs and executes his own work.

Of gutta percha, caoutchouc, kamptulicon, and other similar materials, the Committee have no experience that can be relied on. A gutta percha boat was taken out to the Arctic Regions last spring, but the time of trial was too short for any decisive opinion to be formed on its merits. It is stated that the material shrinks, and it certainly will not bear a continued chafe; nor do we know the effect of heat and cold upon it. It is, however, quite possible that some of these materials may prove useful in the internal fittings of a life-boat. A

combination of gutta percha and cork, by CLARKSON of the Strand, and another consisting of gutta percha, between two layers of thin wood, or a lamina of wood, coated with gutta percha and caoutchouc, by Mr. FORSTER, R.N., seem likely to be well adapted for air-cases. A notion seems prevalent that gutta percha is very light, but its specific gravity is little less than that of water, or, in other words, it will hardly float. JEFFERY'S marine glue may also be found useful in the internal fittings of a boat, in joining cork, &c.

4. As regards extra buoyancy:—

Extra buoyancy, or that required beyond what the materials used in the construction of the boat will afford, is the characteristic feature of a life-boat, and as such its nature, amount and distribution, deserve the most deliberate consideration. If sufficient buoyancy can be obtained by cork, it is far preferable to air-cases, as not being liable to accident. As before mentioned, the Committee have reason to believe that cork may be used entirely under the flat or floor of the boat, so as to reduce the internal capacity, and enable the boat to free herself of water. The only doubt is as to its weight; but it appears that cork varies considerably in weight as well as in price, the commonest description of cork, such as used by fishermen as floats for their in-shore nets, does not exceed 12 lbs. weight per cubic foot, and costs about 12*s.* a cwt.; a heavier sort, also used by fishermen, weighs about 15 lbs. per cubic foot, and costs 15*s.* a cwt. These two might be advantageously disposed in the bottom of a boat, formed into a solid mass by marine glue, and the boat might then bid defiance to accidents, as thus armed, even if bilged against a rock, she would float.

There is one point connected with the use of cork for buoyancy that deserves a passing remark. From the number of models that have cork outside on the bottom, and from the cork when thus placed being reckoned as buoyancy in the written descriptions that accompany them, there seems reason to believe that some of the builders have considered that cork so situated is of more avail as buoyancy than if it were in the bottom inside the planking. Now this is a fallacy; for if the same form for the external body of the boat be taken in each case, and the whole weight of the boat be the same, the same weight of cork being employed, whether applied externally or internally, the boat would float at the same water line. There are those who argue that the cork when placed to form the exterior shape of the boat gives additional buoyancy, or, in other words, causes the boat to swim higher out of the water, but with the knowledge that the water displaced in each case must be equal in weight to the weight of the boat, and that those weights are equal, it follows that the results on the immersion must be the same; or that the position of the cork could have no effect on the depth of immersion, or on the buoyancy of the boat.

If, however, a doubling of cork be brought on outside, in addition to the complete boat, then, of course, the external form of the boat being altered, the buoyancy will be increased by the difference of the specific gravities of cork and water, less the fastenings. Cork is useful outside to protect the bottom of the boat against a rocky beach, but, from its usually unfair surface, it has a tendency to retard the speed of the boat. Extra cork should not be applied to the bottom of a boat without due consideration, for if, as in several of the models which have large air-cases under the flat and no ballast, cork were applied to the bottom outside, its effect must be to raise the boat out of the water and thereby lessen the boat's stability, and allow her the more easily to upset.

With respect to air; the great difficulty of rendering vessels permanently

air-tight makes it unfit for general use, unless great care and watchfulness be exercised. In those instances in which the air-cases are built into and form part of the boats, it seems doubtful whether any of them can be depended upon for a year, and from various inquiries that have been instituted the Committee have reason to believe that there does not exist at this moment a complete air-tight case (undetached) in any life-boat that has been six months in use around the coasts of Great Britain. As to air-cases that are detached, they may be better, but unless in the form of small casks, as in the Liverpool boats and in those of the Shipwreck Institution, there seems sufficient reason to suspect them all. Metal air-cases offer rather a more reasonable prospect of security; but when a life-boat was laid open in Woolwich Dockyard a few years since, it was found that from corrosion there were several holes half an inch in diameter in the copper tubes, supposed to have been air-tight; in fact copper, like other metals, is liable to corrode, and the more so when placed in conjunction with sea-water. The weight, too, of copper tubes makes them objectionable. It has been the practice of TEASDEL, an experienced life-boat builder at Great Yarmouth, to build his detached air-cases of thin boards of willow wood, which is both tough and light, and to cover them with painted canvas, but it might be an improvement to interpose a sheet of gutta percha between two thin boards, according to FORSTER's process.

Before quitting the subject of the nature of extra buoyancy, the Committee consider themselves called upon to warn sailors, and the public generally, against one of the schemes submitted to them, and termed by the inventor "Patent Buoyancy," otherwise, dried rushes done up in linen or canvas bags. This material, however promising it may be at first sight, sooner or later is sure to imbibe moisture when used, and then, instead of having floating properties, it must act as ballast. Mr. CHATFIELD, Assistant Master-Shipwright at Woolwich Dockyard, has officially reported on the unsuitableness of these rushes for giving buoyancy. At Bude, on the north coast of Cornwall, in October last, might be seen a boat, called a life-boat, thus fitted; it had been lying in a canal for a few months, and was completely waterlogged, so much so that the water was awash with the gunwale. It is to be feared that some of the so-called "life-boats," which all sea-going passenger steamers are required to carry by a recent Act of Parliament, are fitted with these dried rushes. They will assuredly fail them in time of need. What are termed life-belts and life-buoys, similarly fitted, are also extensively distributed on board our river steamers. For this latter purpose, neither air nor rushes should be used; cork only should be trusted to, and from the great external resemblance of the spurious articles to the genuine cork life-buoy in form, size, and colour, it may be feared that many persons are deceived into purchasing what may in the hour of danger cost them their lives.

The amount of extra buoyancy may be much less than it has hitherto been customary to give in a life-boat. The cubical contents of the air-cases of many existing life-boats, and of a great part of the models submitted for competition, measure from 200 to 300 feet, equivalent to the support of from 6 to 9 tons of dead weight. Now, if only intended for buoyancy to balance the extra weight likely to be put into a life-boat, this amount is unnecessary. The Liverpool life-boat, already alluded to as having on one occasion brought on shore 60 persons from a wreck, had not above 60 cubic feet of extra buoyancy; this is too little, but in a 30-feet boat, provided with ample delivering-valves, 100 cubic feet, or the equivalent of 3 tons, is sufficient extra buoyancy for all general purposes.

The distribution of extra buoyancy requires great care. As a general rule, it should be placed high in the boat, so as not to affect her stability; but circumstances require this rule to be slightly modified. To reduce the internal capacity of the boat that she may rise under the weight of a heavy sea that may fall on board, and to enable the delivering-valves to act freely, a certain amount of space should be occupied under the flat or floor of the boat, so as to exclude the water; and the question is, so to fill this space with a material of less specific gravity than water, yet sufficiently heavy to ensure the boat's stability when the flat or flooring is laid at from 12 to 14 inches above the keelson, or about the water-line of intended immersion; thus acting generally as ballast, but on emergency as extra buoyancy. From the various plans submitted, this would seem the most difficult problem to solve in the whole arrangements of a life-boat. In some existing life-boats, and in many of the models sent in, reduction of internal capacity is attempted by placing a tight deck fore and aft at from 16 to 18 inches, and even in some at 24 inches above the keelson, with only air beneath; the result is, that all the weights in the boat are raised above her centre of gravity, and there is a risk of her upsetting when a sea is shipped. Some of the models thus fitted on being tested as to their stability, by having a bucket of water thrown into them when afloat in the river, went over directly. Other competitors, foreseeing this result, added an iron keel to their boats; while some inserted a well or tank amidships for water-ballast, which, as long as it remains in its place, compensates for the amount of air, and restores the equilibrium. Others have tried a combination of cork and air, alternately distributed, so as to preserve the requisite stability of the boat. But although conceding full merit to water-ballast, which has the advantage of being taken in only when the boat is afloat, and thus leaving her light for transport along shore, the Committee have come to the conclusion before stated, that cork is the safer material, and that it may be placed under the flat, up to about 12 inches in height above the keelson, and combine the properties of ballast generally, with extra buoyancy in case of need; if upon the cork a light water-tight deck be placed, with a grating over it, the cork will be preserved and very little water will remain to inconvenience the crew or passengers.

The next point to attend to in the distribution of the extra buoyancy is to place the requisite amount of air-vessels in the head and stern sheets of the boat from the floor up to gunwale height, always taking care to leave a passage of 18 inches wide up to within two feet of the stem and stern-post, to enable a man to stand there and receive people from the wreck, as it commonly occurs that a boat cannot go alongside a stranded vessel, but has to receive the men either over the head or stern of the boat. Air-cases may also be placed on the bows and quarters without occupying space that should be reserved for passengers; but they should not be fitted within a few feet each way of the middle of the length of the boat, as, if the forces are nearly equally balanced, it will be difficult for a boat to right herself against the resistance offered by the flat tops or projections of midship side air-cases. This appears to be a point that has been overlooked by most of our boat-builders. In all cases in which air-cases are used, it is recommended that they be not built into the boat, but be detached so that they may be examined to test if they are air-tight, there being great reason to fear that such is not the case in general. Besides, air-cases built into the sides are liable to open with the working of the boat, or to be stove in going alongside a wreck, as in a recent instance, and thus a boat would be disabled. If they be used under the flat, and it is considered neces-

sary that they should form part of the boat, they should always be divided into compartments, so that if one failed, the others would not be affected by it.

5. As to internal capacity for holding water:—

The more the internal capacity is reduced consistently with leaving space for a rescued crew, the better the life-boat. If practicable, the internal capacity for holding water up to the level of the thwarts of a boat 30 feet long should not exceed three tons. It may be diminished by side air-cases from the thwarts to the floor, or by air-cases under the thwarts. On this latter mode of reducing capacity there is a difference of opinion, some contending that it is an advantage to break up a sea, and prevent the water rushing fore and aft the boat, while others think that it is better to let the sea have a fair range, and that then much of the water that comes in over the bows would go out over the stern. The balance seems rather in favour of filling up under the thwarts; it has the certain advantage of reducing capacity.

6. As to the means of freeing the boat of water:—

In order to efficiency, every life-boat should be provided with the means of freeing herself rapidly of any water she may ship. This would seem a self-evident proposition; but it appears not to be admitted as such by the designers of many of the models, as in them no provision is made for it beyond a bucket for baling. Not to multiply proofs of the necessity for such an arrangement, it is sufficient to cite, as decisive on the point, the recent instance of the Liverpool life-boat, in October last having been obliged to cut her tow-rope and bear up for the Mersey, in consequence of having shipped a succession of seas. If a boat has large internal capacity, say from six to seven tons, which is not unusual in the Yarmouth boats, and she ships a heavy sea, or a succession of seas, or if, as is commonly the case, while under storm sails the crew pull out their plugs and let the boat fill up to her water-line for ballast, should a sudden squall carry away her masts, how is that weight, in addition to the weight of the boat, to be propelled by 12 oars against a heavy sea? it would be impracticable, and the relief of the wrecked vessel must, in such a case, be abandoned.

By means of sufficient delivering-valves or tubes, led through a platform or flat laid about the level of the water-line, there seems no reason why the water when shipped should not be carried off rapidly. The area of the valves or tubes should be ample, not less than one square inch for each cubic foot of capacity; more would be better. A question may arise whether it is better that the boat should free herself by tubes through the bottom, or by scuppers in the sides as shown in several of the models; the former is the more direct and quickest action, but the tubes are liable to be choked in the possible case of a boat grounding on an outlying sand-bank, or on the bar of a river harbour; it will be better, therefore, to be provided with both to meet such an accident. The tubes and scuppers might be closed by self-acting valves if thought necessary; a simple modification of an apparatus known as KINGSTON'S valve would answer the purpose effectually.

7. Provision for self-righting:—

The power of self-righting is a contested point among the best boat-builders; but they seem hardly to have given the subject full consideration. The accidents that have happened to life-boats have not been carefully investigated, and the necessity for meeting these accidents with a remedy has not forced itself upon their minds. But a remedy is necessary. Recent and sad experience has shown that a life-boat may be upset and may drown the crew from want of

being able to right herself. Had the South Shields life-boat that upset last year possessed the means of self-righting, there is reason to believe that many of the crew might have been saved, whereas 20 of the best pilots out of the Tyne were drowned. This, however, is not the only instance of a boat upsetting and remaining bottom up, as will be seen hereafter; but it is sufficient to prove the absolute necessity of grappling with the difficulty, if difficulty it be, and of overcoming it. Most life-boats have good sheer of gunwale, and, consequently, raised extremities, in which air-cases (or light cork) should be placed, in order that when the boat is bottom upwards, their buoyancy may co-operate most effectually with the weights in the bottom of the boat (now raised, it may be, considerably out of the water) to restore her to her originally upright position. The higher the centre of gravity of a vessel or boat is above the centre of buoyancy, *cæteris paribus*, the less is her stability; and by the separation of these two centres, a condition of instability will ensue, the effect of which will be, that with the slightest motion, the boat will reverse her position, or right herself. To determine the necessary extent of separation of these centres in each case involves careful calculation. The best mode of applying this principle will readily occur to most boat-builders. The objections to the raised air-cases at each end are the wind they hold in pulling off a lee-shore, and the difficulty of approaching the stem and stern of the boat; the latter may be modified, the former must be tolerated for the greater benefit in another respect that arises from their adoption. If air-cases be used in the extremes to obtain the buoyancy, a thin layer of cork on the top will afford great protection to them, and better footing for the crew when necessity requires them to stand on them.

8. As to ballast:—

If the requisite stability, and righting power, can be obtained without ballast, it is very desirable to avoid the incumbrance it causes, in case of having to transport a boat along shore. In this respect water-ballast has a great advantage, as it is not taken in until the boat is fairly afloat, and may be discharged directly she again touches the beach on landing. Water-ballast, if used in immediate connexion with air-tight cases, as it always must be, requires very good workmanship in the bulk-heads or partitions of the well, in order that they may not become leaky by straining when at sea, or by shrinking when the boat stands ashore, which she sometimes does for a year together. A doubt may arise, too, whether a boat does not require her ballast as much or more at the moment of launching than at any other time; lightness has its advantages, but in launching through a surf a boat requires a certain weight so as not to be readily thrown aside by a breaking sea. All these circumstances considered, the Committee incline to the opinion that ballast given by cork inside in the bottom of the boat is best adapted to meet the varied contingencies to which a life-boat is subjected.

Although a minor point, it may be as well to add, that a moderate sized cork fender, say four inches in diameter, should be carried round the sides and both ends of the boat at about six inches under the gunwale; but there is no occasion for the unwieldy fender, occasionally 24 inches deep, that may be seen in some life-boats. Holes in the bilge pieces, to enable a man to lay hold of them, should the boat be upset; timber heads, to make warps fast to at each bow and quarter; long sweep oars for steering at each end; a stout roller in the stem and stern-post to receive the cable; spare oars, one for each two that the boat pulls; life-belts, life-buoys, and life-lines; hand-rockets; heaving-lines, and such minor fittings are indispensable in every life-boat.

A necessary adjunct to a life-boat is a carriage for transporting it along shore, or, when the tide is out, for carrying the boat down to the water, and launching it without risk into the sea. The building a good carriage is a problem not easily solved: among the many models of carriages sent in for inspection not one exactly fulfils the conditions which appear essential. The carriage should combine lightness with strength to carry at least 40 cwt. in case of need. The boat should be supported as near the ground as may be, so that it does not risk striking the bottom in going over a rocky beach; the wheels should be of large diameter for facility in moving, with broad tires, to prevent their sinking into the sand. The subject appearing to require much consideration, combined with a practical knowledge of details, an application was made to the MASTER-GENERAL and the Board of Ordnance, which was immediately acceded to, and directions given for a carriage to be built in the Royal Arsenal at Woolwich, where it is now in course of construction, under the superintendence of Lieut.-Col. COLQUHOUN, R.A., of the Carriage Department of that establishment.

On several occasions in the course of this Report allusions have been made to accidents which have happened to life-boats, as illustrating the necessity of certain qualities in them, and it appears to the Committee that one of the most valuable aids towards the improvement of our boats would be a detailed account of all such disasters that from time to time have occurred. The Committee cannot undertake this record; but it may be hoped that some competent person may be found with sufficient leisure and perseverance to carry it out. Fully impressed with the value of such a register, the Committee sent a circular to some of the most experienced men on the coast, and they annex the result of their inquiries in hopes that some one will complete them. The cases are mentioned without the least intention of imputing blame to any party, but solely with a desire to find a remedy, if possible, for the causes of the disasters as far as we know them. They are as follows:—

At Hartley, on the coast of Northumberland, five miles north of Tynemouth, in the year 1810, one of Greathead's life-boats, carried overland from Blyth, rescued the crews of several fishing-cobles that were prevented landing by a high sea tumbling in suddenly upon the coast, unaccompanied by wind. On returning towards the shore, the boat incautiously got too near the South Bush Rock, when a heavy sea broke on board and split her in halves; the result was, that the whole of the crew, 34 in number, were drowned.

At Shields, about the year 1820, Greathead's original life-boat, in taking the crew out of the ship *Grafton* stranded on Tynemouth Rock Heads under the Spanish battery, struck upon a rock, bilged, and swamped, but she nevertheless remained upright and brought both crews safely to land. This boat had no air-cases, but was filled with cork inside and out.

At Sandy Cove, Kingstown, Dublin Bay, in December, 1822, the life-boat, under charge of Lieut. HUTCHISON, R.N., went off to the assistance of the brig *Ellen* of Liverpool, stranded in a heavy south-east gale. The boat had reached the wreck, and the men were coming down over the stern into her, when she filled; the crew attempted to bale the water out with their hats, when another sea fell on board, washed six men, and all the oars, and everything out of the boat, which drifted ashore among the rocks. On this occasion four men were drowned. The wreck drove higher up the beach on the flowing tide, and at low water the crew were rescued.

At Lowestoft, in 1825, the life-boat went off to the sloop *Dorset*, wrecked on

the southern part of the Holm Sand, in a south-east gale and spring ebb-tide, which caused a very heavy sea on the sand. In consequence of the crew not raising the plugs of the delivering-valves soon enough, the boat filled with water, became unmanageable, and part of the *Dorset's* crew were drowned. The boat, however, although floating level with the lower part of the gunwale, succeeded in reaching the shore in safety with the remainder of the crew of the sloop.

At Winterton, Norfolk, about the year 1829, the life-boat went off to a stranded vessel, the *Mariner*, and while lying alongside her, the flat or deck of the boat blew up, the boat swamped, and the men saved their lives by taking refuge on board the vessel they went to aid. The life-boat was of the form of a steamer's paddle-box boat; it had what was intended to be an air-tight deck, from 12 to 14 inches above the keelson, but it was always difficult to keep tight, and in the end, as before stated, was forced up by the water beneath it.

At Appledore, Devon, in December, 1833, the life-boat, in going off to the brig *Mary Anne*, of Exeter, stranded on the Northam Burrows, was struck by a heavy sea, and turned *end over end* it is believed; two of the crew who had lashed themselves to the thwarts were drowned, a third got his lashings loose enough to keep his head above water in the bottom of the boat, and was taken out alive when the boat drove on shore, bottom up, about an hour after. On this occasion three men were drowned; the remainder of the crew were taken off the life-boat by another boat. Had this boat had the power of self-righting, there seems no reason why the men should not have been saved.

At Scarborough, in 1836, the life-boat went off through the breakers to the rescue of a vessel; as the boat approached the outside of the broken water, a heavy overlap of the sea caught her and turned her *end over end*, shutting up one of the crew inside, where he remained in safety, getting fresh air through the tubes in the bottom, and was taken out when the boat drifted, bottom up, on the beach. Ten lives were lost. This boat is fitted with an air-case under her flat, contents 140 cubic feet, and with a small well for water-ballast, holding about 16 cubic feet, or half a ton.

At Blyth, in Northumberland, in October 1841, the life-boat was pulling off against a strong wind, when a heavy sea struck the boat, caused her to run stern under, and to half fill with water. From want of delivering-valves the boat could not free herself, she became unmanageable and fell off the wind, when a second sea struck her, and she capsized. On this occasion 10 men were drowned. The boat had an air-case about 15 inches deep under her flat or platform.

At Whitby, in October 1841, the life-boat was pulling off in a strong E.N.E. gale and a cross sea, to carry provisions to some fishing-yawls that were in distress for food, when a heavy sea struck the boat at the same time that she was caught by a strong fresh running out of the harbour, and she capsized. No lives, we believe, were lost. This boat has an air-case 13 inches deep under her platform.

At Tynemouth Haven, in 1842, the life-boat went off on trial in a long rolling swell from the north-east; on returning towards the shore, under sail, a heavy sea topped on her quarter, hove her over on her beam ends, and filled the sail, when she turned bottom up, and thus drove ashore; the crew were taken off by a coble, and all saved.

At Robin Hood's Bay, on the coast of Yorkshire, seven miles south of Whitby, in February 1843, the life-boat went off to the assistance of a stranded vessel, the *Ann* of London, during a fresh northerly gale. The life-boat had got alongside the wreck, and was taking in the crew, and it is supposed four or five men jumped into her at once on one side, and a heavy sea striking her at the same time, she capsized. Many of the crew got on her bottom, while three remained under, and in this state she was drifted towards the shore on the opposite side of the bay. On seeing the accident from the shore, five gallant fellows launched a coble (fitted with air-cases as a life-boat), and tried to pull off to the rescue; but she had hardly encountered two seas, when she was turned *end over end:* two of her crew were drowned, and she drifted ashore bottom up. On this occasion Lieut. LINGARD, R.N., of the Coast Guard service, and 11 men, lost their lives. Three men came on shore safely under the life-boat, and some on her bottom, the others were washed off. Had the life-boat possessed the power of self-righting, there seems no reason why most, if not all her crew, should not have been saved.

At Bude, in Cornwall, about the year 1844, the life-boat was exercising when she shipped a heavy sea, dipped her quarter, and turned *end over end.* Two men were drowned. This boat is of the form of a steamer's paddle-box boat, with air-cases in her bottom 12½ inches deep amidships, contents 105 cubic feet; the surface of the flat or flooring is about on a level with the water-line. The air-case is divided into five compartments, but at the time of the accident it is said that the after compartment was not tight, and consequently it filled with water.

At Penrhyn Du, Carnarvon, in the year 1847, the life-boat went off to the assistance of a vessel in distress; there was a heavy cross sea on, and the boat was upset, or, it is said, turned *end over end:* the crew supported themselves on the bottom of the boat for some time, when they made an effort to right her, when the boat rolled right round and remained on her face. The crew supported themselves until taken off by another boat.

At South Shields, on the 4th December, 1849, the life-boat, manned with 24 pilots, went out to the aid of the *Betsy*, of Littlehampton, stranded on the Herd Sand; there was a heavy sea from the eastward, but little wind, and a strong ebb tide. The boat had reached the wreck, and was lying alongside with her head to the eastward, with a rope fast to the quarter, but the bowfast not secured. The shipwrecked men were about to descend into the life-boat when a heavy knot of sea recoiling from the bow of the vessel, caught the bow of the boat and turned her up on end, throwing the whole of the crew and the water into the stern sheets. The bowfast not holding, the boat drove in this position, astern of the vessel, when the ebb tide running rapidly into her stern, the boat completely turned *end over end*, and went ashore bottom up. On this occasion 20 out of 24 of the crew were drowned under the boat. On seeing the accident two other life-boats immediately dashed off from North and South Shields, saved four of the men, and rescued the crew of the *Betsy.*

The boat to which this sad accident happened is 34 feet long over all, and nearly 11 feet breadth of beam. It is of the form of a steamer's paddle-box boat, as Plate 6, or nearly of the original GREATHEAD form, has 30 inches sheer of gunwale, and 11 inches curvature of keel. It is fitted with an air-case under the flat or deck 15 inches in height, which contains 224 cubic feet of

air, with a well for water-ballast in the middle holding 30 cubic feet, or 17 cwt. when full. The surface of the flat or deck is 20 inches above the underside of the keel; and the boat is fitted with flat-topped air-cases around the sides. The boat had an open well when the accident happened, and when thrown over end the water-ballast would run out into her stern. Had she possessed the power of self-righting it is fair to suppose some of the men might have been saved.

It is but justice to add, and it is a fact highly honourable to the port, that the life-boats at Shields have been in constant use since GREATHEAD first launched his boat there on the 30th of January, 1790, now 60 years since, and, with the exception of the above accident, it is stated that no life has ever been lost in them, nor any life been lost from want of them. No record prior to 1841 was kept, but between the years 1841 and 1849 no less than 466 persons have been brought safe on shore from stranded vessels.

At Liverpool, in October 1850, the life-boat, in going out to the ship *Providence*, in tow of a steam-tug, in a very severe gale and heavy sea, shipped a succession of seas, when there being no means of freeing the boat except baling by buckets, the crew cut the tow-rope, and ran back to the Mersey. This appears to be a very rare occurrence, as in the course of the last 11 years the life-boats at Liverpool have been the means of assisting 269 vessels, and have brought on shore 1,128 persons, affording decisive proof of the value of life-boats when well manned and properly managed.

At Broadstairs, on the 6th March, 1851, the life-boat gallantly went off to the brig *Mary White*, stranded on the Goodwin, rescued seven of the crew out of ten, but, unfortunately, the boat's gunwale was stove while lying alongside the wreck; and the air-cases, *being built into the boat*, filled with sand and water; the life-boat thus became disabled, and was drifting away to sea when it was picked up by a lugger, and brought on shore.

These instances are all that have come before the Committee; but as far as they go they are instructive, as pointing out some evils which it is right to shun, and some defects which require a remedy. But especially do they enforce a point which the Committee consider of essential importance, namely, the absolute necessity of a well-trained crew, and of sailor-like management of a life-boat. All the best qualities combined in one boat will not compensate for want of seamanship and judgment in the coxswain of the boat, who should be cool, steady, acquainted with the set of the tides, and know whether it is right to approach a wreck end on with his boat under her quarter, or to lay her alongside under the lee, or to drop his anchor to windward and veer down to the wreck, as is the usual practice with the Yarmouth and Deal boats, and for which purpose every life-boat should be provided with a heavy anchor and good cable. It is not any peculiarly good quality in the form of the Yarmouth and Deal luggers that enables them to brave the sea in all weathers, but it is the admirable manner in which they are handled by their hardy crews. And if we are to have an efficient set of life-boats along the coasts of the United Kingdom, it is absolutely necessary that fishermen and sailors should enrol themselves as crews and go out frequently for exercise in heavy weather, so as to become familiarized with the qualities of their boats and to know exactly what they will do in the hour of need. They need no longer have a misgiving about their safety. That a thoroughly good life-boat can be built no longer admits of a doubt; and any boat-builder who will construct a boat

after the lines shown in Plates 1 or 13 may rest assured that he will turn out a boat that, if properly handled, need not fear to face any weather at sea.

The Committee consider themselves bound to mention to your Grace the assistance they have received, and the facility and accommodation that have been afforded them during the whole of this prolonged inquiry, by the Lords Commissioners of the Admiralty, in permitting them the use of apartments and attendants at Somerset House, and in excusing officers from their usual duties so as to enable them to give their undivided attention to the subject: had it not been for such indulgence this Report could not have been prepared for some months to come.

In the course of the inquiry, some facts relative to the number of wrecks, and to the state of our coasts generally as to the means of saving life from shipwreck, have come before the Committee, and as they are so immediately connected with the subject under consideration, they feel that they should ill respond to your Grace's humane intentions did they omit to add a brief summary of them: in the full belief that had the facts been more generally known such a state of things could not have been allowed to exist. From official returns it appears, that in the course of the last year there were 692 vessels, of 127,188 tons burthen, wrecked belonging to the United Kingdom, or nearly two a-day. Of these only four were steamers. By a reference to the wreck chart for the year 1850 alone, which accompanies this Report, it will be seen that 681 British and Foreign vessels were wrecked on the coasts, and within the seas of the British Isles. Of these vessels, 277 were total wrecks; 84 were sunk by leaks or collisions, 16 were abandoned, and 304 were stranded and damaged so as to require them to discharge cargo—making a total of 681 wrecks. As nearly as can be judged, 780 lives were lost. However large it may appear, this is not any very unusual number, a nearly similar amount is annually lost, leaving a proportionate number of widows and orphans.

It is not an uncommon occurrence for a single gale of wind to strew the coast with wrecks. In three separate gales which occurred in the years 1821, 1824, and 1829, there were lost on the east coast of England, between the Humber and the Tees, 169 vessels. In the single gale of the 31st August and 1st September, 1833, no less than 61 British vessels were lost on the sands in the North Sea, and on the east coast of England. In the disastrous gale of the 13th January, 1843, 103 vessels were wrecked on the coasts of the United Kingdom. In the gales of 1846 as many as 39 vessels got ashore in Hartlepool Bay alone. In the single month of March, 1850, not less than 134 vessels were wrecked on our own coasts, or an average of more than four a-day. These instances which happen to have been made public by being laid before Parliament are only a few out of the number that might be cited, and even these probably fall short of the real numbers. No complete record of shipwrecks is kept: Lloyd's List, however full, is confessedly imperfect. But the facts quoted are sufficient to prove an appalling amount of loss of life, and the absolute necessity that exists for establishing around our coasts the most perfect means in our power for the preservation of life from shipwreck.

The extent of those means at present is comprised in the following meagre state-

ment :—In Scotland, with a seaboard of 1,500 miles, there are eight life-boats; at St. Andrews, the Tay, Arbroath, Montrose, Aberdeen, Wick, Ardrossan, and Irvine; some of these boats are in tolerable repair, that at Wick is quite new, others are quite unserviceable. The boats at Aberdeen, Montrose, and St. Andrews, have been the means of saving 102 lives. There are MANBY's mortars at 9 stations, and rockets at 7 stations; they have been instrumental in saving 81 lives. Orkney and Shetland are without any provision for saving life, and with the exception of Port Logan, in Wigtonshire, where there is a mortar, the whole of the west coast of Scotland from Cape Wrath to the Solway Firth, (an extent of 900 miles, without including the islands,) is in the same state.

In England and Wales, with a seaboard of 2,000 miles, there are 75 life-boats ; of these 45 are stationed on the east coast. On the shores of Northumberland, from Berwick-on-Tweed to the Tyne, there are seven boats, or one for every eight miles; there are three at Shields; 15 on the coasts of Durham and Yorkshire, or one for every 10 miles; in Lincolnshire, 4 boats, or one for every 15 miles; on the coasts of Norfolk and Suffolk, from Cromer to Southwold, there are 10 boats, or one for every five miles; a fact highly creditable to the County associations. There are life-boats also at Aldborough, Harwich, and Broadstairs.

On the south coast, from Dover to the Land's End, a distance of 420 miles, there are seven life-boats, but none at Penzance where most needed. At the Scilly Isles there is one inefficient boat; the same at St. Ives and Bude; and a little better at Padstow. So that from Falmouth round the Land's End by Trevose Head to Hartland Point, an extent of 150 miles of the most exposed coast in England, there is not a really efficient life-boat. In the Bristol Channel the North Devon Association maintains three life-boats in Bideford Bay. There is a new life-boat at Ilfracombe, and one at Burnham. On the south coast of Wales—from Cardiff round to Fishguard, a distance of 200 miles—there is one life-boat, at Swansea, and that unserviceable. There are 12 boats on the west and north coasts of Wales, some in a very defective state ; and 9 in good order at five stations in the important port of Liverpool, liberally supported by the Dock Trustees, and having permanent boats' crews. These boats, as before mentioned, have brought on shore 1,128 persons during the last 11 years, thus proving the value of life-boats when kept in an efficient state and properly managed. In all there are 28 boats, one-half unserviceable, to supply the wants of a seaboard 900 miles in extent, from the Land's End to the Solway, including the ports of Liverpool and Bristol.

In the Isle of Man, which from its position near the centre of the Irish Sea, and in the midst of a great part of the traffic of Liverpool and Belfast, Glasgow and Dublin, has its shores much exposed to wrecks, there is not a single life-boat. The four boats established here by the exertions of the late Sir WILLIAM HILLARY, Bart.—a name honourably associated with that of Mr. THOMAS WILSON, formerly M.P. for the City of London, as founders of the National Shipwreck Institution—have been allowed to fall into decay, and hardly a vestige of them remains.

From official returns, it appears that many of the coast-guard stations on the shores of England and Wales are supplied with rockets or mortars, at the expense of Government, and some stations have both. There are 91 stations

which have rockets, 38 which have mortars alone, and 38 which have both mortars and rockets. At first sight this seems a fair proportion, and so it would be if the rockets were efficient; but the returns go on to say, at 24 stations rockets have burst, and at 42 stations lines have broken. In some instances the rockets were old, in others badly made, and the lines in the same state. Yet even with these drawbacks, rockets and mortars have proved most useful. At 22 stations where a record has been kept, not less than 243 lives have been saved by them, besides several crews at Caistor, near Yarmouth, and many lives at eight other stations, where no account has been kept of the number. The veteran Captain MANBY may reflect with just gratification in his declining years that the mortar he was instrumental in bringing into use as a means of saving life, has proved very serviceable.

In Ireland, with an extent of 1,400 miles of coast, there are eight life-boats, and they are inefficient. Yet there is no part in the United Kingdom in which wrecks are more frequent than on the coast of Wexford; and when we consider that, in addition to the cross-channel trade, the whole of the foreign trade to Liverpool, and Glasgow and Belfast, passes through the Irish Sea, the frequency of wrecks on the east coast of Ireland need not create surprise.

There are 22 stations in Ireland at which there are either rockets or mortars; but here, as well as elsewhere on the coasts, lines have broken and rockets have burst; the rockets, too, might be better distributed. Yet, notwithstanding these minor evils, which may be set right without any great difficulty, the testimony in Ireland as well as in England is decisive as to the value of the rocket in effecting communication with a stranded vessel, and thus saving life from shipwreck.

Fully admitting the good service that both rocket and mortar have rendered in their present state, the Committee have formed a strong opinion that the rocket and line may be greatly improved. The maximum range now attained with DENNETT'S 9-lbs., or CARTE'S 12-lbs. life-rocket in fine weather is 350 yards, but in stormy weather, such as that in which wrecks usually occur, it seldom reaches 300 yards. On many parts of the coast such a limited flight would not reach a stranded vessel; it seems desirable, therefore, to make every effort to increase the range, whether by an improvement in the rocket, or by substituting a lighter line of Manilla or other hemp; and, considering the importance of the object and its intimate connexion with the life-boat, the Committee may be permitted to express their earnest hope that the experiments on this subject which they understand have been set on foot, will be continued with as little delay as possible until a favourable result is obtained.

In looking over the list of wrecks, no one can fail to be struck at the prominent position occupied by the officers and men of the coast-guard service on all such occasions. The records of the National Shipwreck Institution show that about one-third of the medals and rewards granted by that Institution for meritorious services are awarded to the coast-guard. Independently of their other services, they have proved themselves in cases of wreck to be an invaluable body of men: they are familiar with the use of the mortar and the rocket; are always on the watch; always ready to act; and nothing can be more striking on such occasions than the advantage of a well-trained organized body acting as one man, over a willing, but undisciplined, assemblage of sailors and fishermen. On any future occasion of shipwreck, we may trust that the

coast-guard officers and men will display the same energy that has hitherto so honourably distinguished them.

An attentive consideration of the wreck chart appended to this Report, and a careful examination of the returns of wrecks by the coast-guard officers, forcibly impresses on the mind the painful conviction that the greater part of the casualties that occur are not occasioned by stress of weather, but that they are mainly attributable to causes within control, and to which a remedy might be applied. It would be an easy task to enumerate these several causes, but from the absence of exact information it would be difficult to assign the particular cause to each wreck. It might have been reasonably expected that the depositions before the Receivers of Admiralty Droits would have thrown some light on the subject, but those documents are seldom of any use for ascertaining the real cause of wreck. The master of the stranded vessel is naturally anxious to make out the best case for himself, and usually tells as little as he can help; and the Receiver, who nine times out of ten is a landsman, is quite unequal to bring out the facts of the case. Some competent local tribunal then is necessary before whom the causes might be investigated on the spot, and there would seem no difficulty in forming such a tribunal; it might be as easily managed as a coroner's inquest; the machinery for the purpose is ready organized. The Inspecting-Commander of Coast-guard of the district, the Collector or chief officer of Customs, and Lloyd's agents are to be found nearly everywhere around the coasts, and they would form a tribunal well acquainted with nautical affairs, and in which all merchants and shipowners would have confidence; and were such a body, with the assistance of the nearest magistrate, authorized to inquire into, and report to the Admiralty or Board of Trade on, every case of wreck, there is little doubt but that in a very few years the list of wrecks on our own coasts would be diminished one-sixth. It is well and right to place life-boats, but a better means of preserving life would be to prevent or diminish shipwrecks.

It is not only loss of life to a fearful extent that occurs in these wrecks, but, although a minor consideration, the loss of property is enormous. In the Parliamentary Report on shipwrecks of the year 1836, the loss of property in British shipping wrecked or foundered at sea, is estimated on an average of six years at three millions sterling per annum; we may fairly therefore assume that half that amount is annually lost on our own coasts. The whole of this property, though covered by insurance to certain parties, is not the less absolutely lost to the nation, and its cost paid for by the British public, on whom its loss must ultimately fall. The same Parliamentary Report estimates the annual loss of life by the wreck or foundering of British vessels at sea at 1,000 persons in each year, and this loss is also attended with increased pecuniary burthen to the British public, on whom the support of many of the widows and orphans left destitute by such losses eventually devolves. Thus taking only the financial view of the case, the prevention or diminution of shipwreck would be a great national gain.

A review of the facts furnished by the Returns is suggestive of two important considerations. It affords both a warning as to the past and an encouragement as to the future: a warning to those who have allowed the boats at certain stations to fall into decay, while it teaches us that humane intentions, in order to be serviceable to our fellow-creatures, must be fully and efficiently carried into action. On the other hand, it offers a cheering encouragement as to the future, inasmuch as the number of lives saved from

shipwreck through the instrumentality of life-boats, mortars, and rockets (even in their present imperfect, and, on many parts of the coast, ill-organized state), affords undoubted proof of the value of such means for preserving life. Wherever the boats have been looked after, and the crews well trained, as at Liverpool, Shields, and on the coasts of Norfolk and Suffolk, the most signal success has rewarded their exertions. This fact is most encouraging, and cannot be too strongly insisted upon. It is the most gratifying reward to the several local committees and individuals who have perseveringly done their duty, and gives firm ground of encouragement for the future.

The path then is clear and distinct. The first step is to ensure a safe and powerful life-boat, and this the Committee feel confident has been accomplished; the next is to build a sufficient number of such boats, place them where required, organize and train the crews, and provide for their supervision and maintenance;—in fact, to do for the rest of the United Kingdom what your Grace has liberally undertaken to do for the coast of Northumberland, namely, to place a well-built life-boat at each of the most exposed points of the coast, and rockets or mortars at all the intermediate stations.

There need be no misgiving for want of funds; no work of real benevolence in this country, when undertaken in the right spirit, was ever allowed to languish for lack of means, and it is not to be believed that the cause of the preservation of life from shipwreck will not find equal support. It is not to be believed that the British public will quietly look on and see a thousand lives annually perish and not make an effort to save a portion of that number, if satisfied that the means of doing so are within their reach. Past experience declares that the means are within our reach. Nor would the task be difficult; the question has only to be grappled with in earnest, and all obstacles will vanish. There is no doubt of hearty co-operation along the whole of our coasts; all that local committees require is to be well directed, and to be enabled to place entire confidence in those who undertake to guide them.

The success that has attended exertions in one place may fairly be reckoned upon in another. There seems no reason why a very few years should not see a life-boat stationed at each of the exposed points on the most frequented parts of the coasts of the United Kingdom; by means of which—with the blessing of Divine Providence upon the endeavours of those who undertake the work—the best results to the cause of humanity may confidently be anticipated.

JOHN WASHINGTON, *Captain R.N.*
ISAAC WATTS, *Assistant Surveyor of the Navy.*
JOHN FINCHAM, *Master Shipwright in H.M.'s Dockyard, Portsmouth.*
ARTHUR W. JERNINGHAM, *Commander R.N.*
JAMES PEAKE, *Assistant-Master Shipwright in H.M.'s Dockyard, Woolwich.*

I fully concur in this decision and Report.

BALDWIN W. WALKER, *Surveyor of the Navy.*

APPENDIX.

CONTENTS.

John Ainsworth, Boatbuilder, Bridlington, Yorkshire.

Model and Drawing; scales 1 in. and ½ in. to a foot.

Description.—The form of this boat is that usually given to a whale-boat, a tolerably flat floor, sides round in a fore-and-aft direction, raking stem and stern-post, clench-built, of wainscot, and copper fastened.

Length extreme, 34 ft.; of keel, 26 ft.; breadth, 8½ ft.; depth, 4½ ft.; sheer of gunwale, 36 in.; straight keel 6 in. deep; rake of stem and stern 6 in. in a foot. The boat has 7 thwarts, 27 in. apart, 9 in. below the gunwale, and 24 in. above the floor; pulls 12 oars, double banked, with pins and grummets. Cork fenders 6 in. thick, and 24 in. deep, extending two-thirds the length of the boat, at the height of the gunwale.

Extra buoyancy is obtained by an air-case in the bottom 24 in. deep, air-cases along the sides 30 in. wide and 20 in. deep; air-cases under the 4 midship thwarts, and under the head and stern sheets; the whole divided into compartments. Effective extra buoyancy 300 cubic ft., equal to 8 tons. No ballast, but an open well which would hold about one ton of water. Internal capacity up to the level of the thwarts 128 cubic ft., equal to 3¼ tons. Means of freeing the boat of water, 10 tubes of 3½ in. diameter each; total area 96 square in., which is to the internal capacity in the proportion of 96 to 128 or as 1 to 1·33. The provision for righting the boat is by air-cases 7 ft. long up to the height of the gunwale in the head and stern sheets. To be steered by a sweep-oar at either end; there are 4 timber-heads for warps, one on each bow and each quarter. Draft of water with 30 persons on board, 24 in. Weight of boat, 46 cwt; of gear, 5 cwt.; total weight, 51 cwt. Would carry 40 persons. Cost, 70*l.*

Remarks.—This boat would pull well in smooth water, but her great height above the surface would impede her progress against a strong head-wind and sea. As a sailing-boat, for which her form is better adapted, she would require ballast.

The great sheer and raised air-cases at the extremities are intended to cause her to right herself in the event of being upset; but with the wide midship side air-cases and absence of weight in the bottom, it is doubtful whether she would do so. Her small internal capacity for holding water is a favourable feature in her mode of fitting; and the timber-heads are well-placed for securing warps to. A passage should be left in the raised air-cases for a man to approach the stem and stern.

The area of the delivering-valves would be better increased in order to discharge more rapidly a heavy sea that may be shipped. The air-cases under the thwarts prevent the water rushing fore and aft, and aid in diminishing the internal capacity. The great height of the flat, 24 in., with a large air-case beneath it for the whole length of the boat, and with only one ton of water in the well to compensate, would endanger her stability, and render the boat liable to be upset if a heavy sea fell on board her.

James Beeching, Boatbuilder, Great Yarmouth.

Model and Drawing; scale 1 in. to a foot.

Description.—The body of this boat is of the form usually given to a whale-boat—a slightly rounded floor, sides round in the fore and aft direction, upright stem and stern post, clench-built, of wainscot oak, and iron fastened.

Length extreme 36 ft.; of keel 31 ft.; breadth of beam 9½ ft.; depth 3½ ft.; sheer of gunwale 36 in.; rake of stem and stern-post 5 in.; straight keel 8 in. deep. The boat has 7 thwarts 27 in. apart, 7 in. below the gunwale and 18 in. above the floor; pulls 12 oars, double-banked, with pins and grummets. A cork fender. 6 in. wide by 8 in. deep, runs round outside at 7 in. below the gunwale.

Extra buoyancy is given by air-cases 20 in. high in the bottom of the boat under the flat; round part of the sides, 24 in. wide by 18 in. deep, up to the level of the thwarts, leaving 10 ft. free amidships; and in the head and stern sheets, for a length of 8½ ft., to the height of the gunwale; the whole divided into compartments and built into the boat; also by the cork fenders. Effective extra buoyancy 300 cubic ft., equal to 8½ tons. For ballast a water-tank divided into compartments, placed in the bottom amidships, 14 ft. long by 5 ft. wide and 15 in. high, containing 77 cubic ft., equal to 2¼ tons when full, and an iron keel of 10 cwt. Internal capacity of boat under the level of the thwarts 176 cubic ft., equal to 5 tons. Means of freeing the boat of water, tubes through the bottom, 8 of 6 in. diameter, and 4 of 4 in. diameter—total area 276 square in., which is to the capacity in the proportion of 276 to 176, or as 1 to ·64. Provision for righting the boat if upset, 2¼ tons of water-ballast, an iron keel, and raised air-cases in the head and stern sheets. Rig, lug foresail and mizen; to be steered by a rudder; no timber heads for securing a warp to. Draft of water, with 30 persons on board, 26 in. Weight of boat 50 cwt., of gear 17 cwt.—total 67 cwt. Would carry 70 persons. Cost, with gear, 250*l.*

Remarks.—The form given to this boat would make her efficient either for pulling or sailing in all weathers; she would prove a good sea boat, and in places, such as Yarmouth, where there are always plenty of hands to launch a boat, her weight would cause no difficulty. By means of the raised air-cases placed at the extremes; the absence of side air-cases, for a length of 10 ft., amidships; the introduction of 2¼ tons of water-ballast into her bottom when afloat; and her iron keel; this boat would right herself in the event of being capsized; although from the form given to her it is highly improbable that such an accident should occur.

A passage should be left in the air-cases to approach the stem and stern, for on many occasions the only way in which a life-boat can go near a wreck is end on, when the crew of it must be received either over the stem or the stern. The deep keel, 8 in., however favourable for sailing, for steadying her in a seaway, and for aiding her in righting, would be a disadvantage in beaching, and would render the boat more difficult to turn in case of wishing to place her end on to a heavy roller coming in. The area of the delivering-valves is large in proportion to the internal capacity, and would rapidly free the boat of water, down to the level of her draft, which, with her crew on board, would not be to less than to a depth of some inches above the floor. The air-cases are built into the boat, which renders them liable to accidents; if this were remedied, and her internal capacity reduced, a 30 ft. or 32 ft. boat built on similar lines, with her internal fittings slightly modified, would make an efficient life-boat, adapted for many parts of the coast.

James Bertram, 16 East Street, Manchester Square, London.

Model and Drawing; scale 1 in. to a foot.

Description.—This boat is of a form similar to a whale-boat, but with more beam; a long flat floor, a straight side in the fore-and-aft direction, raking stem and stern-post, carvel built, of oak, and copper fastened.

Length extreme, 30½ ft.; length of keel, 25 ft.; breadth, 9 ft.; depth, 3 ft.; sheer of gunwale, 12 ins.; rake of stem and stern-post 5 ins. in a foot; straight keel 3 ins. deep. The boat has 8 thwarts, 27 ins. apart, 9 ins. below the gunwale, and 24 ins. above the floor; she pulls 8 oars, single banked, in crutches. No fenders or life-lines.

Extra buoyancy is obtained by air-cases formed by the combination of two boats, one within the other, at 10 ins. apart, the space between being divided into compartments, and made water-tight; effective buoyancy, 130 cubic feet, equal to nearly 4 tons. The boat to be ballasted, when required, by the admission of water into the lower portion of some of the above-named compartments. Internal capacity of the boat under the thwarts 200 cubic feet, equal to 5½ tons. The means for freeing the boat of water are 3 scuttles through the bottom, averaging 16 inches square each, total delivering area 774 square inches, which is to capacity in the proportion of 774 to 200, or as 1 to ·26. The provision for righting the boat is by 3 valves opening into the top of the air-cases on one side only, with escape-valves for the air at the lower part of the case. To be steered by an oar. No timber-heads for warps, and no rig described. Draft of water, with 30 persons on board, 2 feet. Weight of boat 26½ cwt., of gear 2½ cwt.; total weight 29 cwt. Would carry 30 persons. Cost, 90*l.*

Remarks.—This boat, from her form, would pull fairly and sail moderately, and her light weight would enable her to be transported readily along a beach if required. From the large area of the delivering-valves, as compared to the internal capacity, the boat would easily free herself of water to the level of her draft, but this would be always some inches above the floor.

The peculiar feature in the boat consists in having the power of introducing water into the air-cases in her bottom, to act as ballast in the event of being upset, through valves in her broad gunwale. The boat might right herself if the valves acted; but from the slight sheer of gunwale and absence of raised air-cases at the extremities, all would depend upon the opening of three self-acting valves, and should they be set fast, or any accident happen to them, the boat would not right. As in many similar models, the air-cases form a part of the boat, without any lining, so that in the event of the broadside being stove alongside a wreck, the boat would be disabled; an accident that is far from being uncommon in life-boats, and occurred to the Broadstairs boat only in March last.

Benjamin Birch, Boatbuilder, South Shields.

Model and Drawing. Scale 1 in. to a foot.

Description.—The form of this boat resembles that of a steamer's paddle-box boat, but with more rake of stem and stern-post, both ends alike, flat floor, sides straight in the fore-and-aft direction, clench-built, of wainscot, and copper fastened.

Length extreme, 34 ft.; length of keel, 24 ft.; breadth of beam, 11¾ ft.; depth, 3¾ ft.; sheer of gunwale, 27 in.; rake of stem and stern-post, 10 in. in a foot; straight keel, 1½ in. deep. The boat has 6 thwarts, 7 in. wide, 30 in. apart, 7 in. below the gunwale, and 13 in. above the floor; she pulls 12 oars, double banked with pins and grummets. A fender of cork, 5 in. thick in the middle, extends along the sides for a depth of 2 ft. from the gunwale to the level of the platform outside.

Extra buoyancy is obtained by air-cases under the flat on an average 27 in. deep, contents 460 cubic ft.; air-cases along the sides 18 in. wide, sloped from gunwale to platform, and air-cases in the extremities up to gunwale height, the whole built into the boat, and divided into compartments. Effective extra buoyancy 540 cubic ft., equal to 15 tons. For ballast, water admitted into a tank amidships 6 ft. square and 1 ft. deep, equivalent to 1 ton. There are escape-pipes for the air. Internal capacity of the boat for holding water up to the levels of the thwarts 164 cubic ft., equal to 4¾ tons. The means of freeing the boat of water are 10 scuppers at the sides 6 in. diameter each, total delivering area 280 sq. in., which is to capacity in the proportion of 1 to ·6. Provision for self-righting in the event of being upset, consists in raised air-cases in the extremities, and 1 ton of water-ballast. To be steered by a sweep-oar at either end. No rig shown, nor any timber-heads for securing a warp to. Draft of water with 30 persons on board, 18 in. Weight of boat with gear, 50 cwt. Would carry 50 men. Cost 180*l.*

Remarks.—This boat, from her form, would pull well in smooth water, sail fast off the wind, and be buoyant in a seaway. From her short keel and raking stem and stern-post, the boat would be easily turned and placed end on to a heavy rolling sea; but these qualities which are so far useful, render the boat difficult to steer steady, and rather more difficult to launch, as the weight of the boat is divided over a shorter length: this remark applies equally to all this class of boats, and more so to those that have much camber or curvature of keel.

This boat has the peculiarity of having the largest amount of extra buoyancy of any model sent for competition, a great portion of which is under the platform, or in the worst position for stability, and with only one ton of water-ballast to compensate for it, and the builder does not appear decided as to the necessity for that amount of ballast, as he says it is only "to be used if required." The internal capacity of the boat for holding water is fair; the area of the delivering-valves ample, and they are placed at the side, so that in case of the boat grounding on a bank or bar of a river, they would not be blocked up. The provision for self-righting consists in fair sheer of gunwale, raised air-cases in the extremes, and one ton of water-ballast in the bottom, but it is doubtful whether the boat would right itself. The builder is, we believe, foreman to Messrs. Oliver, well known builders at South Shields, in whose yard was built one of the life-boats now stationed at South Shields, that at Blyth, and at Wick, in Caithness.

Robert Blair, Sea Pilot, South Shields.

Model and Drawing; scale 1 in. to a foot.

Description.—The form of this boat is that usually given to a whale-boat, having both ends alike, or more like a steamer's paddle-box boat, round floor, sides round in a fore-and-aft direction, very raking stem and stern-post.

Length extreme, 35 ft.; length of keel, 25 ft.; breadth, 12 ft.; depth, 4½ ft.; sheer of gunwale, 33 in.; rake of stem and stern, 9 in. in a foot; camber of keel, 18 in. and 2 in. deep. The boat has 7 thwarts, 24 in. apart, 6 in. below the gunwale, and 21 in. above the floor; pulls 14 oars, double banked, with pins and grummets. A cork fender, 4 in. wide and 24 in. deep, extends round the side level with the gunwale.

Extra buoyancy is given by an air-case 24 in. deep in the bottom flat; air-cases 15 in. wide and 18 in. deep round the sides up to the gunwale, and a midship air-case, 18 in. wide, up to the level of the thwarts, the whole divided into compartments and formed in the boat: also the cork fender. Effective extra buoyancy, 250 cubic feet, equal to 7 tons. No ballast. Internal capacity, up to the thwarts, 210 cubic feet, equivalent to 6 tons. Means of freeing the boat of water by 8 scuppers of 5 in. diameter; total area, 156 sq. in., which is to capacity in the proportion of 156 to 210, or as 1 to 1·3. No provision for righting the boat. No rig shown. Timber-heads at each end for securing warps to. To be steered by an oar at either end. Draft of water, with 30 men on board, 23 in. Weight of boat, 90 cwt.; of gear, 7 cwt.; total, 97 cwt. Could carry 70 persons. Cost, 195*l.*

Remarks.—This boat would pull moderately, and sail fairly off the wind; would be lively in a seaway, and from the camber given to the keel and the rake to the stem and stern, would be easily winded under all circumstances, and be placed end on to a heavy sea. The midship air-case, when the boat shipped a sea, would assist her stability by confining part of the water to windward; but the air-case, 24 in. high in the bottom, under the flat, without being compensated by ballast, raises the weights too high and interferes with the requisite stability to withstand a heavy sea.

The boat would not right herself if capsized, and although the area of the delivering-valves is passable, yet the boat would not readily free herself, as in rolling, the windward or upper portion of the scuppers would be nearly useless. The very great weight of the boat would render her difficult to transport along shore for general service; but for a stationary life-boat, as at the mouth of the Tyne, where there are always plenty of pilots ready to man her, this point might not so much signify. As in many similar models, the air-cases forming a part of the boat, without any lining to protect them from accident in case of the boat being stove, is objectionable. The inventor states that the boats stationed at North and South Shields are very similar to this model, and have been the means of saving many lives.

Thomas Costain, Boatbuilder, Liverpool.

Model and Drawing; scale 1 in. to a foot.

Description.—The body of this boat is very similar to that of a ship's pinnace, with ends alike; a small rise in the floor, but a long one in a fore-and-aft direction; sides straight at the water-line, both vertically and horizontally; stem curved, slightly raking stern-post; diagonally built, of double planks of ⅛ in. larch, and copper fastened.

Length extreme, 30 ft.; of keel, 27 ft.; breadth, 9¼ ft.; depth, 4 ft.; sheer of gunwale, 18 in.; straight keel, 4 in. deep, and bilge pieces; rake of stem, 5 in. and of stern-post 2 in. in a foot. The boat has 6 thwarts 33 inches apart, 8 in. below the gunwale and 21 in. above the floor; pulls 12 oars, double banked, with thole-pins. A cork fender, covered with leather 4 in. wide and 7 in. deep, is placed all round the sides, at 6 in. below the gunwale. A flat runs fore and aft, at 12 in. above the keelson.

Extra buoyancy is obtained by means of 12 air-tight casks, secured along the sides fore and aft by wooden cases, 21 in. wide, by 21 in. deep between the flat of the floor and the underside of the thwarts. Cubical contents of the casks 35 ft., equal to 1 ton. No ballast. Internal capacity, up to the level of the thwarts, 230 cubic ft., equivalent to 6½ tons. The only means of freeing the boat of water is by baling; nor is there any provision for righting the boat in case of being upset. She is to be steered by a rudder, or by a sweep-oar at either end. Two rollers are placed in the stern; there is a timber head for securing a warp to; and a bollard, for towing, steps into the place of the foremast. The boat is rigged with two sprit-sails and a jib; has an anchor and cable. Draft of water, with 30 passengers on board, in. Weight of boat, 30 cwt.; of gear, 7 cwt.; total, 37 cwt. Would carry 50 persons. Cost complete, diagonally built, 180*l.*; if clench-built, 149*l.*; exclusive of sails, anchor, &c., 129*l.*

Remarks.—This boat, from her form, would stand well up under her canvas and would pull well. The diagonal mode of building gives her great strength; she has good width between the thwarts for the rowers, a necessary precaution in a heavy sea; and her air-casks, being detached from the side, do not risk being stove alongside a wreck; a very wise provision. The boat, if she does not weigh more than 30 cwt., is of a well-proportioned weight, sufficiently light to be transported along a beach without difficulty, at the same time heavy enough to resist and make headway against a sea; although it appears that at Liverpool, owing to the great distance of some of the outlying sands, the boats are nearly always towed out by steam-tugs to near the site of the wreck. This boat would not right herself in the event of being upset. Her great internal capacity, exceeding 6 tons under the thwarts, without any means of freeing herself in the event of shipping a heavy sea, renders the boat liable to be disabled for pulling; and in fact, such a case occurred in October, 1850, when, while being towed out by a steam-tug, the boat shipped so much water that, having no means of freeing her, the crew were obliged to cut the tow-rope and run back to port.

Such an accident, however, must be of rare occurrence, as it appears that there are nine boats built (on this model we believe) stationed at Liverpool, and between them they go out, on an average, 40 times a-year; there are also similar boats at Carnarvon, at Anglesey, and at Shoreham. The Liverpool life-boats have been the means of assisting 269 vessels, and saving 1,128 lives during the last eleven years, so that the boat must be a fine sea-boat, and which, perhaps, has a great deal to do with it, must be efficiently manned and well managed.

JOHN EDMOND, Boatbuilder, Scarborough.

Model and Drawing; scale 1 inch to a foot.

Description.—This model is of the form of a north-country coble, with round sides, square overhanging stern, flat bottom abaft, sharp deep bows, curved stem, and very raking stern-post; keel to the forebody and draughts, clench built, of wainscot below and larch for top-sides, and copper-fastened.

Length extreme, 27 ft.; length of keel or ramboard, 20 ft.; breadth 7¼ ft.; depth amidships, 2¾ ft.; height of stem, 5¼ ft., of stern, 2½ ft.; sheer of gunwale, 16 in.; rake of stern, 6 in., of stern-post, 11 in. in a foot. The boat has 4 thwarts, 10 in. wide, 30 in. apart, 10 in. below the gunwale; and 12 in. above the flat; to pull 8 oars, double-banked, with pins and grummets. A fender of cork is carried round outside at 6 in. below the rail.

Extra buoyancy is obtained by an air-case under the flat 12 in. deep, and by air-cases in the extremities up to gunwale-height, the whole divided into compartments and built into the boat. Effective extra buoyancy, 64 cubic ft., equal to nearly 2 tons. For ballast, an iron forefoot or keel of 3½ cwt., and a sliding keel. Internal capacity for holding water up to the level of the thwarts, 105 cubic ft., equivalent to 3 tons. Means of freeing the boat of water by 2 flap-scuppers on each side amidships, 18 in. by 3 in.; whole delivering area, 208 square in., which is to capacity as 1 to ·5. Provision for righting the boat in the event of being upset consists in air-cases in the extremes, a fixed iron keel, and a sliding-keel, 18 in. deep, if required. Rig, one lug sail; no timber-heads for securing a warp to; to be steered usually by a rudder which projects 4 ft. below the bottom of the boat abaft; but also by a sweep-oar at stem and stern. Draft of water, with 20 persons on board, 27 in. Weight of boat and keel, 23 cwt.; of gear, 4 cwt.; total, 27 cwt. Would carry 30 persons. Cost, complete, 53*l.*

Remarks.—This boat, from her form, would pull well in not very stormy weather, and would go to windward or sail well with a side wind, but would be difficult to steer before the wind blowing hard. She would be a fair sea-boat if kept out of broken water; but the lowness of her stern renders her liable to ship a sea unless kept end on to it. The good qualities of the coble on the north coast of England when employed as a pilot or fishing-boat, and in shallow-water and for landing stern on, or embarking from a flat beach, are too well known to require further remark; but the form does not seem suitable for the general purposes of a life-boat, that often has to bring on shore a heavy cargo running before a gale of wind and following sea. In the sad accident at Newbiggin, in March last, three cobles went down by the stern, and 11 fishermen were drowned.

The internal capacity of the boat is large, but the delivering-scuppers are ample in area, and although through the sides instead of, as usual, through the bottom, the boat would readily free herself of water. The raised air-cases in the extremes, iron forefoot, sliding-keel, and the absence of midship side air-cases, would most probably cause the boat to right herself in the event of being upset. The light weight of the boat would give great facility for transport along a beach; and by means of the powerful rudder or the sweep-oar she could readily be turned to meet a heavy sea. The air-cases, being formed in the boat, are objectionable as very liable to be stove in approaching a wreck; and the difficulty of keeping the flat or deck air-tight is so great that it would be worth the builders' consideration whether light cork might not be substituted for the bottom air-cases, and so avoid all risk.

WILLIAM FALKINGBRIDGE, Boatbuilder, Whitby.

Model and Drawing; scale 1 in. to a foot.

Description.—The form of this boat resembles that of a whale-boat in general outline, with a flat floor, straight side, raking stem and stern-post. carvel built, of oak, with copper fastenings. Length extreme, 35½ ft., of keel, 29 ft.; breadth 8½ ft.; depth 3½ ft.; sheer of gunwale 27 in.; straight keel 3 in. deep; rake of stem and stern 6 ins. in a foot. The boat has 7 thwarts, 28 in. apart, 6 in. below the gunwale, and 15 in. above the floor; pulls 14 oars, double banked, with pins and grummets. No fenders; a man-rope, with stanchions, 6 in. high, runs round the gunwale.

Extra buoyancy is given by air-cases, 18 in. deep, fore and aft, under the deck; air-cases 22 in. wide by 18 in. deep, along each side up to the level of the thwarts, and in the head and stern sheets for 5½ ft. in length up to the height of the gunwale, the whole divided into 96 compartments, and built into the boat; effective extra buoyancy 342 cubic feet, equal to 9½ tons. For ballast, an iron keel of 3½ cwt. Internal capacity of boat under the thwarts 90 cubic feet, equal to 2½ tons. The means of freeing the boat of water are by 6 tubes of 4½ in. diameter, total area 95 square in., which is to internal capacity in the proportion of 95 to 90 or as 1 to ·94. Provision for righting the boat, in case of being upset, raised air-cases 5½ ft. long at the extremities, and an iron keel of 3½ cwt. A timber head at each end for securing warps; no rig shown. To be steered at either end by a sweep-oar. Draft of water with 30 persons on board, 22 in., when the water would stand 4 in. deep on the floor. Weight of the boat 47½ cwt., including gear. Would carry 60 persons. Cost, 115*l.*

Remarks.—This boat, from her form, would pull well. Her peculiar feature is great buoyancy; the air-case 18 in. deep in her bottom so far reduces the internal capacity of the boat as to enable her to rise up under a great weight of sea, while the large area of the delivering-valves in proportion to the internal capacity would enable her to free herself readily of any water that might be shipped The boat, also, has good width between the thwarts for the rowers, and the rake of the stem and stern would facilitate the placing her end on to meet a heavy sea.

The raised air-cases at the extremities, the iron keel, and the diminished width of the midship side air-cases for a length of 7 ft., are intended to cause the boat to right herself in case of being upset, but it may be doubted whether she would do so without increased weight in the keel. The 18 in. deep air-case in the bottom, without any ballast to compensate for it, will deprive the boat of the requisite stability in contending against a heavy sea, and might render her liable to be upset; the side air-cases being built into the boat, would be exposed to damage by being stove either by floating spars or alongside a wreck; the weight, 47½ cwt., is rather too great for transporting along a beach; otherwise her small internal capacity for holding water, and the narrowed midship side air-cases, are good points in her favour.

GEORGE FARROW, Boatbuilder, South Shields.

One Model; scale 1 in. to a foot.

Description.—The form of this model is that of a steamer's paddle-box boat, flat floor, sides straight, in a fore-and-aft direction, full ends, carries her width well forward and aft, very raking stem and sternpost, clench built, of Riga wainscot, and copper fastened.

Length extreme 30 ft., of keel 22 ft., breadth 10 ft., depth 3¾ ft., sheer of gunwale 24 in., camber of keel 20 in., depth 4 in., with bilge pieces, rake of stem and sternpost, 7 in. in a foot. The boat has 5 thwarts 9 in. wide, 30 in. apart, 5 in. below the gunwale and 11 in. above the floor, pulls 12 oars, double banked, with pins and grummets. A cork fender 1 ft. wide, runs round outside at 9 in. below the gunwale, and a gangboard 11 in. broad extends fore and aft amidships upon the thwarts.

Extra buoyancy is obtained by an air-case under the platform 15 in. deep fore and aft above the well, and 30 in. deep in the ends; by side air-cases sloped from gunwale to floor; and in the head and stern sheets for a length of 6 ft. to gunwale height, the whole divided into compartments and built into the boat: effective extra buoyancy 260 cubic ft. equal to 8 tons. For ballast the boat has a tank amidships 15 in. deep and 14 ft. long, extending across the boat, contents 3 tons; it is divided by transverse partitions to prevent the water ranging in a sea-way, with limber holes to keep up free communication near the keel, and others near the platform, in case of the boat upsetting; the tank can be closed when full, and escape-tubes for the air are provided; also an iron keel.

Internal capacity of the boat up to the level of the thwarts 120 cubic feet, equivalent to 3¼ tons; means of freeing the boat of water 10 tubes 3½ in. diameter each, total delivering area 96 square inches, which is to capacity in the proportion of 96 to 120, or as 1 to 1·25. Provision for righting the boat in the event of being upset consists in water ballast at the bottom, an iron keel, and raised air-cases in the extremes. No rig shown, and no timber heads for securing a warp to. To be steered by a sweep-oar at either end. Draft of water with 30 men on board, 2½ feet. Weight of boat 50 cwt.; of gear 7 cwt.; total 57 cwt. Would carry 50 persons. Cost 130*l.*

Remarks.—This boat would pull well in smooth water, sail fast off the wind, and be buoyant and lively in a seaway. Her short and curved keel and raking stem and sternpost would enable her to be rapidly turned so as to be placed end on to heavy breaking sea, but they would render her difficult to steer steadily. She has small internal capacity below the level of the thwarts, and a fair number of delivering-tubes, but they would be better if of larger area.

The boat has ample extra buoyancy, but it is chiefly obtained by an air-case under the flat or deck; if, under any circumstances, such an arrangement is advisable, it might be here where the air-case is compensated by a large closed well, containing 3 tons of water-ballast; but the great difficulty of keeping the bulkheads tight, and the danger should the water find its way into the head or stern (as has been the case in several life-boat accidents), induces the Committee to prefer cork in the bottom, which is not exposed to the slightest risk, and has the property of acting as ballast generally, and would aid as buoyancy in case of emergency.

FARROW claims to be the original inventor of the closed tank for water ballast; this is a point on which the Committee decline to offer an opinion, but they are bound to state that the documents which he has forwarded would appear to bear him out in that claim, as early as the beginning of 1843. The principle is now common to many models sent from different parts of the country.

The provision for self-righting consists in good sheer of gunwale, raised air-cases at the extremes, water ballast, and an iron keel, and to judge by the model, the boat would right herself. A good passage is left between the raised air-cases to the extremities of the boat to enable the crew of a stranded vessel to be received over the stem or stern, and to give room for using the steering oar. This boat is a fair type of the generality of the Tyne and Wear life-boats, and as such is represented in Plate 6. The builder, it appears, gained the prize in a life-boat competition at South Shields, in December, 1841; and again at a competition in Newcastle, in March, 1850.

Joseph Francis, New York. United States of America.

Three Models; scale 1 in. to a foot.

Description.—The "life surf boat," as the builder terms her, is a shallow, flat-bottomed boat, alike at both ends, with high cone-shaped air-cases at each extremity, raking stem and stern, and no keel.

Length extreme, 27 ft.; length of flat, 22 ft.; breadth, 7 ft.; depth, 2½ ft., sheer of gunwale, 27 in.; rake of stem and stern, 7 in. to a foot. The boat is of galvanized iron, corrugated, made by machinery which, it is stated, at the same time gives the requisite form and the corrugation. She has 6 thwarts, 15 in. wide, 21 in. apart, 6 inches below the gunwale, and 20 in. above the floor; they have air-cases underneath them, and thus divide the boat into six compartments, having no connexion with each other; a plug 3 in. in diameter is placed in each on the side for the escape of water. A stout rope fender, with life-lines attached to it, is carried round both sides of the boat at 9 in. below the gunwale.

Extra buoyancy is obtained by cone-shaped air-cases at each extremity, 4½ feet long, which at their square ends rise 20 inches above the gunwale at that part, and by air-cases under the thwarts. Effective extra buoyancy, 75 cubic ft., or 2 tons. No ballast. Internal capacity up to the level of the thwarts, 110 cubic ft., equal to 3 tons. No means shown in the model to enable the boat to free herself of water that may be shipped. The provision for righting her consists in the raised air-cases at each extremity of the boat. No masts or sails. No timber-head for securing warps to. Said to carry 20 persons. The boat is to pull six oars, single banked, with pins and grummets, and to steer with a sweep-oar. Draft of water, with crew on board, 20 in.; weight of boat, as stated, 9 cwt.; of gear, 4 cwt.; total, 13 cwt. Cost, 45*l*.

The "metallic life car," a model of which is sent by the same builder, is a shallow, flat-floored boat of galvanized iron, both ends alike, 26 ft. long, 7 ft. wide, and 3½ ft. deep, with a straight stern and keel. It has a high cone-shaped cover, rising from each end to 4½ ft. above the gunwale amidships, where a space of 6 feet is left for the opening of the main hatchway, otherwise every part of the boat is water-tight, the object being, when communication is once established with a stranded vessel by a line and hawser, to put the passengers into this covered car and drag them ashore through the surf unharmed.

The testimonial that accompanies the model states, that in the wreck of the emigrant ship *Ayrshire*, on the coast of New Jersey, in a snow storm on the 12th January, 1850, the whole of the passengers, 201 in number, including women, children, and infants, were landed in safety by means of one of these cars, stationed on the beach by the United States Government, who, in the year 1849, established 8 life-boat stations, at about 10 miles apart between Sandy Hook and Little Egg harbours. The stations are furnished with boats, cars, rockets, and mortars, at a cost of about 2,000*l*. for the whole.

Remarks.—The corrugated galvanized iron of which this boat is composed is said by the inventor to combine lightness, strength, economy, and durability, in a greater degree than any other material or any other mode of construction; and it is the novel application of the principle of corrugation to boat-building which he claims as the peculiar merit of his boat. Her light weight, if no more than stated, would make her easily transportable, and her strength would enable her to land on a rocky beach unharmed. The raised air-cases at each end, and the absence of midship side air-cases might cause the boat to right herself in the event of being upset. As a surf life-boat, if by that term is meant merely for landing on the beach, the shallow form of the boat might be suitable for such a purpose, but it is not adapted for the general purposes of a life-boat as used in this country, to go to some distance off shore to a stranded vessel. The flat bottom and high air-cases at each end would render the boat both difficult to propel against a strong head wind and difficult to steer. The water shipped might, perhaps, be rolled out on each side, otherwise there is no provision for freeing herself of it, and with the crew only on board, it would stand within 4 in. of the level of the thwarts. There are no timber-heads for securing warps to, and the raised air-cases prevent the approach within 4½ feet of either end of the boat, a serious objection when a life-boat is obliged to approach a wreck end on, which is commonly the case.

The printed testimonials sent with this model are much in favour of boats of metal, and the boats in which Lieutenant Lynch, of the United States Navy, made his successful descent down the rapids of the river Jordan to the Dead Sea, in the year 1848, were of copper. It appears, also, that metallic life-boats are placed by the Government at several stations along the shores of the United States. But with respect to the use of the life surf-boat, there is a want of sufficient evidence in the testimonials referred to as to the nature of the shore, the distance the boat had to go off to the stranded vessels, the state of the weather, and the weight of the sea the boat had to contend with, all of which are important points in the consideration of the subject; sufficient, however, is adduced to establish that in strength, lightness, durability, and economy, metal boats have great advantages for particular purposes.

Since the above was written, a full-sized boat, similar to the model, has arrived from New York; on weighing her she was found to weigh 19 cwt., instead of 9 cwt. On trial, in smooth water, it was found that with the plugs out, and her crew of six men on board, the water stood inside level with the thwarts, and on adding 5 cwt. of ballast, the water rose within 3 in. of the gunwale; that on two men getting on one gunwale, the boat turned over, throwing all her crew into the water, and lay still bottom upwards; and on the men taking hold of her to right her, she turned over twice like a cask; thus proving that, however fit she may be for a surf-boat on the coast of America, she is quite unsuitable, under her present form, for the general purposes of a life-boat on any part of the coast of this country.

Messrs. JOHN and ROBERT GALE, Boatbuilders, Whitby.

One Model; scale 1 in. to a foot.

Description.—The body of this boat has the general outline of a whale-boat, but with much more beam, flat floor, sides round in a fore-and-aft direction, raking stem and stern; clench-built, of larch, and copper fastened. Length extreme, 30 ft.; length of keel, 18 ft.; breadth, 11 ft.; depth, 3½ feet; sheer of gunwale, 30 in.; rake of stem and stern, 12 in. in a foot; keel, 3 in. deep and slightly curved. The boat has 6 thwarts, 24 in. apart, 9 in. below the gunwale, and 16 in. above the floor; to pull 10 oars, double-banked with pins and grummets. A cork fender, 6 in. wide and 14 in. deep, passes round the boat at 2 in. below the gunwale.

Extra buoyancy is given by an air-case in the bottom 15 in. deep, extending fore and aft; air-cases along the sides 24 in. wide and 18 in. deep, up to the level of the thwarts, and air-cases in the head and stern sheets up to the height of the gunwale; the whole built into the boat, and divided into 26 compartments; also by the cork fenders. Effective extra buoyancy 187 cubic ft., equal to 5½ tons. Internal capacity for holding water up to the level of the thwarts, 180 cubic feet, equivalent to 5 tons. Means of freeing the boat of water by 2 openings in the bottom, 18 in. by 12 each, of an oval form, total area 324 square in., which is to internal capacity as 324 to 180, or as 1 to ·55. These apertures have a wire grating over them, which is to fall open in the event of the boat being upset to admit of the escape of the crew; and life-lines to hold on by are run along the keel. For ballast there is a tank 7½ ft. long by 5 ft. wide, and 15 in. deep, under the deck amidships, which will contain 12 cwt. of water, to be let in by a screw-valve when required. Provision for righting the boat, raised air-cases at the extremities, and 12 cwt. of ballast in the bottom. No rig is shown. This boat is to be steered by a sweep-oar at either quarter, and has a bollard at each end for securing a warp to. A netting is provided, and iron outriggers, 7 ft. long, for extending it along the broadside, for receiving the crew of a stranded vessel, when the boat cannot get close to the wreck. Draft of water with 30 persons on board 18 in. Weight of boat 25 cwt., of gear 3½ cwt., total 28½ cwt. Would carry 45 persons. Cost, 105*l.*

Remarks.—This boat would pull fairly in all weathers; from her breadth, she would be stiff under canvas; but from her round form, in a fore-and-aft direction, would be leewardly. The great object of the builders has been to design a safe boat that should not easily be capsized, and in this they may have succeeded. The large area of the delivering-valves in proportion to the internal capacity would cause the boat to free herself readily of water, and in the possible case of being upset, the size of the apertures in the bottom would enable the crew to crawl through, when they would find life-lines extended along the keel, and might save themselves. The raised air-cases at the extremities of the boat, and the 12 cwt. of ballast in the bottom would assist the boat to right herself in the event of being upset, but it may be questioned whether the flat side air-cases amidships, and the great breadth of the boat might not counteract their effect. The internal capacity of the boat for holding water, equal to 5 tons, might be reduced with advantage.

The netting proposed for receiving a crew when the boat cannot get close to the wreck is the suggestion, we believe, of Dr. Yeoman, M.D., and it might prove useful. It is intended, when required to ship iron out-riggers in sockets ready prepared at the bow and quarter of the boat, and so extend the net the length of the broadside. Sockets might also be fitted round the bows and quarters, as it not uncommonly occurs that the life-boat is obliged to approach a wreck end on, either to anchor to windward and veer down upon the stranded vessel, when the crew are received over the stern of the boat, or to place her stem on to the bow or quarter of the wreck, keeping the boat under command with the oars; in such cases the net might be projected with advantage across the bows or stern of the boat, as the case might be. As a general rule, all unnecessary gear in a life-boat, or anything requiring to be shipped or unshipped, is an evil, but the netting might form an exception. No life-boat has been built after the model now prepared, but the same builders constructed life-boats for Bridgewater Bar, Teesmouth, Robinhood's Bay, and Whitby, which, it is stated, have saved many lives.

William Greener, Aston New Town, Birmingham.

One Model; scale 1 in. to a foot.

Description.—This boat in form resembles a flat-bottomed gun-boat, ends alike, sides round in a fore-and-aft direction; raking stem and stern-post; side open amidships for 15 ft. in length with guard rails, clench-built, of wainscot and American elm, and copper fastened.

Length extreme, 37 ft.; length of keel, 29 ft.; breadth, 12 ft.; depth 2½ ft.; sheer of gunwale, 24 in.; camber of keel, 12 in.; depth, 6 in.; rake of stem and stern, 8 in. in a foot. The boat has 8 thwarts, 28 in. apart, 9 in. below the rail and 12 in. above the floor; she pulls 16 oars, double banked, with pins and grummets. A rubbing-piece extends for 15 ft. along the broadside, at 6 in. below the rail.

Extra buoyancy consists in the whole internal portion of the boat, which has a water-tight deck fore and aft at the flooring height, or 2 ft. above the bottom; it is divided by athwart-ship bulk-heads into three compartments. Effective extra buoyancy, 280 cubic ft., equal to 8 tons. For ballast, water is to be admitted into a copper trunk placed fore and aft just above the keelson; contents stated to be equal to 10 cwt. No water can remain on the deck of the boat, the sides being open amidships for a length of 15 ft. The provision for self-righting consists in the water-ballast, when the boat is upset, flowing into a transverse tube as high as the flooring, and in air-cases in the head and stern sheets up to gunwale height. No rig shown; to be steered by an oar at either end; one timber-head amidships, forward, for securing a warp to. Draft of water with 30 persons on board, 21 in. Weight of boat, 28 cwt.; of gear, 4 cwt.; total weight, 32 cwt. Would carry 50 persons. Cost of boat and gear, 150*l.*

Remarks.—This boat, from her form, would pull well in smooth water, but would be difficult to manage in a seaway; she is of easy draft of water, and could not be swamped. Her buoyancy might aid her in launching from a flat shore, but the air-case under the flat is far too great for stability. It would be difficult in many parts of the coast to man a boat requiring 16 men for her crew. The sides being open amidships for a length of 15 feet, no water could remain on her deck. The provision for righting the boat in the event of being upset consists in the water-ballast being thrown into a tube on the side, and in the raised air-cases at the extremities; but it is extremely doubtful whether the side-tubes would prove efficient for the purpose intended. The builder claims to be the original inventor of the internal trunk along the keelson for ballasting a boat with water, and states that he submitted a model showing this principle at South Shields in 1842, and again in the spring of 1850, at Newcastle. This claim is contested; but the Committee do not wish to offer an opinion on the subject: the mode of ballasting, however, by water being admitted into a closed tank in the bottom, is now common to many of the life-boat models sent from different parts of England.

The inventor has also submitted what he terms a rocket-gun, for throwing a line to a stranded vessel; and states that he can send a line to a distance of 800 yards; if so, it will be a valuable improvement as the extreme range of rockets carrying lines with which we are acquainted is 350 yards.

Charles Gurr, Boatbuilder, Portsea.

Model and Drawing; scale 1 in. to a foot.

Description.—The midship body of this boat has the form of a ship's launch, with extremes similar to those given to a whale-boat, long flat floor, sides straight in a fore-and-aft direction, raking stem and stern-post, clench built, of English elm, and copper fastened.

Length extreme 30 ft., of keel, 21½ ft.; breadth, 7½ ft.; depth, 3 ft.; of gunwale, 19 in.; camber, or curve of keel, 2 in., and 2 in. deep. Rake of stem and stern-post, 12 in. in a foot. The boat has 8 thwarts, 26 in. apart, 6 in. below the gunwale, and 12 in. above the floor amidships; pulls 14 oars, worked in common rowlocks, formed in wash-strakes under the flat, 6 in. deep. No fenders, but a rubbing-piece.

Extra buoyancy is given by air-cases, 12 in. wide and 13 in. deep, round the sides; air-cases, 6 in. wide and 12 in. deep under the thwarts, and in the head and stern sheets up to wash-strake, the whole divided into compartments and built into the boat. Effective extra buoyancy, 150 cubic ft., equal to 4⅓ tons. For ballast, water let into a tank in the bottom, 22 ft. long, 2½ ft. wide, and 22 in. deep, equal to 1 ton in weight. Internal capacity, up to the level of the thwarts, 42 cubic ft., equal to 1½ tons. No means provided to enable the boat to free herself, but a pump is placed between each pair of thwarts for freeing her of water above the floor, as shown in this drawing. The provision for righting the boat consists in the water-ballast in the bottom, and an arrangement by which the water would flow from the bottom tank, on one side only, into one half of the tanks under the thwarts. To be steered by a sweep-oar at either end. No masts or sails. No timber heads for securing warps to. Draft of water, with 30 persons on board, 24 in. Weight of boat, 33 cwt.; of gear, 4 cwt.; total, 37 cwt. Would carry 40 persons. Cost, 80*l.*

Remarks.—This would be a powerful boat under canvas, and would pull well; her raking stem and stern and curved keel would enable her to turn rapidly to meet a heavy breaking wave. She has small internal capacity for containing water shipped in a seaway, and the partitions under the thwarts would prevent the water that might be shipped from rushing fore and aft.

The water-ballast in her bottom, the flow of water to one side, and the arrangement of the air-cases, would probably cause the boat to right, in the event of being capsized; but the builder has not shown how this arrangement is to be carried out. The force-pump proposed for freeing the water above the floor would not be found efficient. She wants timber heads for securing a warp-to; and thole-pins and grummets for the oars would be better than rowlocks, as less likely to be broken in a seaway, or in boarding a wreck.

The boat is narrow for her length, and unless intended for pulling against a strong tide, as in the Bristol Channel or the Humber, would be better for a foot or 18 inches more beam, which would render her more suitable for the general purposes of a life-boat.

Messrs. Harding, Boatbuilders, Whitby.

Model and Drawing; scale 1 in to a foot.

Description.—This boat is of the form usually given to a whale-boat, with a long flat floor, sides round in the fore-and-aft direction, very raking stem and stern, and great sheer of gunwale; clench-built, of oak and larch, and copper fastened.

Length extreme, 30 ft.; of keel, 16 ft.; breadth, 10½ ft.; depth, 3¾ ft.; sheer of gunwale, 36 in.; rake of stem and stern, 12 in. in a foot. Camber of keel 4 in., and depth 4 in. The boat has six thwarts, 24 in. apart, 6 in. below the gunwale, 14 in. above the floor. She pulls 12 oars, double banked, with pins and grummets: no fenders nor life-lines. The peculiar feature of this boat consists in her having another boat within her, hung on pivots at the stem and stern, leaving a space 4 in. wide between the two.

Extra buoyancy is given by air-cases round the sides of the inner boat, 18 in. wide and 18 in. deep, up to the level of the thwarts, and in the head and stern sheets of the outer boat up to the gunwale, formed in the boat and divided into compartments; effective extra buoyancy 150 cubic ft., equal to 4 tons. For ballast, water is admitted into a tank in the bottom, containing about 10 cwt. Internal capacity for water up to the level of the thwarts 90 cubic feet, equal to 2½ tons. Means of freeing the boat of water by an opening in the bottoms of the inner and outer boats, 4 ft. long by 1 ft. wide; area 576 sq. in., which is to internal capacity in the proportion of 576 to 90, or as 1 to ·16. The builders suppose that the inner boat, being suspended on pivots, will always remain upright; but a break is fitted to her amidships to prevent her free motion under ordinary circumstances. To be steered by an oar; a timber head at each end for warps to be secured to. Draft of water, 24 in.; weight of boat, 29 cwt.; of gear, 3½ cwt.; total, 32½ cwt. Would carry 40 persons. Cost 100*l.*

Remarks.—This boat, from her form and her long flat floor, would pull fairly and be buoyant in a seaway, if the water did not rush in at the scuttle in her bottom and fill the space between the boats, which may be feared. From the large area of her delivering aperture, as compared to her capacity, the boat could readily free herself of water to a certain extent; but with her crew on board, it would stand within a few inches of the thwarts. The camber of the keel and great rake of stem and stern posts would enable the boat to turn quickly, in order, if necessary, to place her end on to a heavy sea, but it would make her unsteady in steering.

There would be no risk of the air-cases being stove, being quite protected by the outer boat. Although she has ballast in her bottom and raised air-cases at the extremities, the boat would not right itself in the event of being upset. The proposal of one boat within another is, we believe, novel, and at first sight would seem to get over some of the difficulties to be overcome in planning an efficient life-boat; but in practice it would not be found to answer. The water contained between the two boats would make her pull heavy, and when rolling in a seaway, the men could not pull effectively, from the looms of the oars being forced against the gunwales of the inner boat.

Harvey and Son, Shipbuilders, Halifax, near Ipswich.

Model and Drawing. Scales 1½ in. and ¾ inch to a foot.

Description.—This boat is of the form usually given to a whale-boat, with a moderately long flat floor, sides straight in a fore-and-aft direction, curved stem and raking stern-post; clench-built, of Baltic oak, and iron fastened.

Length extreme, 41 ft., length of keel, 36 ft., breadth, 11 ft., depth, 4 ft. sheer of gunwale, 24 in.; straight keel 4 in. deep, rake of stem 6 in. and of stern, 3 in. in a foot. She has 9 thwarts, 26 in. apart, 7 in. below the gunwale and 20 in. above the floor; pulls 12 oars, double-banked, in crutches. Fenders of cork 12 in. wide by 12 in. deep along the gunwale.

Extra buoyancy is obtained by a midship air-case 30 in. wide, and 20 in. deep, the whole length of the boat, from the floor up to the level of the thwarts; and in the head and stern sheets up to the gunwale, built into the boat, and by the cork fender. Effective extra buoyancy 200 cubic ft., equal to 6 tons. For ballast she has water admitted into a tank 17 ft. 4 in. long, 5 ft. wide, and 15 in. deep under the deck or platform; contents 87½ cubic ft., equal to 2½ tons. Capacity under thwarts for holding water, 367 cubic ft., equal to 10½ tons. The means for freeing the boat of water are 20 valves of 3 in. diameter, area 140 in., which is to internal capacity in the proportion of 140 to 367, or as 1 to 2·62. The provision for righting the boat consists in water-ballast in the bottom and raised air-cases in the extremities. Rig not shown. Steered by a rudder. A timber head at stem and stern for securing warps to. Draft of water with ballast-tank filled and crew of 13 men, 18 in., or equal to a weight of 6 tons. Weight of boat, 40 cwt., of gear, 5 cwt., total, 45 cwt. Would carry 70 persons. Cost, 200*l.*

Remarks.—This boat, from her form and her moderately long flat floor, is better adapted for sailing, but would pull fairly: she would have great stability, and there is little doubt would prove a good sea boat. The ballast in her bottom, raised air-cases at head and stern, and the absence of air-cases at the sides, might enable her to right herself if upset; but the raised air-cases in their present state, without a passage in them, would prevent all access to the stem or stern of the boat within 6 ft., which might be attended with great inconvenience, as it commonly occurs, that the only mode of approaching a wreck is end on. Her great length, 41 ft., would render her difficult to manage on any coast not well provided with beach-men, as Yarmouth, Deal, &c. Her internal capacity for holding water, equal to 10½ tons, is unnecessarily great; and the area of the openings is quite insufficient to free her of such a body of water in a reasonable time. To propel the boat by 12 oars in a gale of wind, against a head sea with 10 or even 5 tons of water in her hold, in addition to her own weight (including ballast and crew, equal to 6 tons more), would be impracticable. The boat, like those at Yarmouth and Deal, is intended for sailing, and there is no doubt as long as she can be kept under canvas, she would do her work well. A 30 ft. boat on the proposed form, with reduced internal capacity (which might be so arranged as to give increased buoyancy in case of need without lessening her stability), would make an efficient life-boat for many parts of the coast.

Commodore Lord JOHN HAY, C.B., Superintendent of H. M.'s Dockyard, Devonport.

Model and Drawing; scales 1½ in. and 1 in. to a foot.

Description.—The general form of this boat is that of a whale-boat; a flat and long floor amidships, straight sides in the fore-and-aft direction, moderate rake of stem and stern-post, peculiar build of narrow planks pinned together through the edges and without timbers, of mahogany, and copper fastened.

Length extreme, 32 feet; length of keel 24 feet; breadth of beam 7½ feet; depth 3 feet 7 inches; sheer of gunwale 25½ inches; rake of stem and stern-post 7 inches in a foot. The boat has 7 thwarts, 25 inches apart, 9 inches below the gunwale, and 11 inches above the flooring; pulls 14 oars, double banked in thole-pins; land-rail 2½ inches deep round the boat, at 4 inches below the gunwale.

Extra buoyancy is obtained by an air-case under the flat or flooring, 20 inches deep, and air-cases in the head and stern-sheets for a length of 6½ feet up to gunwale height. The air-cases to be divided into compartments, covered with gutta percha, and to be detached, so as to be taken out of the boat if necessary. Effective extra buoyancy 200 cubic feet, or nearly 6 tons. No ballast. Internal capacity for holding water up to the level of the thwarts, 140 cubic feet, equal to 4 tons. The means for freeing the boat of water are 5 scuppers on each side on a level with the flooring, 5 inches by 4 inches each; total area 240 square inches, which is, to internal capacity, as 240 to 140, or as 1 to ·6. The water is led to the scuppers by a shoot or watercourse under each thwart, raised 4 inches above the deck, and having its entrance amidships, so that when the boat rolls, the water should not come into the boat through the scuppers. The provision for righting the boat consists in the sheer given to the gunwale, and in raised air-cases at the extremes up to gunwale height. No rig described, nor any timber heads for warps shown. To be steered by a sweep-oar at either end. Draft of water, with 30 persons on board, 19 inches. Weight of boat and fittings 32 cwt. The boat would carry 60 men. Estimated cost 70*l.*

Remarks.—This boat would pull well in moderately smooth water, but her light draft of water and large surface, exposed to the action of a strong wind and head sea, would tend to retard her progress in stormy weather. She would sail fast off the wind. The boat is light for her length, and might be readily transported along shore, yet is of sufficient weight to retain her momentum against a head sea. The boat has small internal capacity for holding water, and the area of her delivering-scuppers is ample; but in experiments with the model, it was found that the position of the entrance of the shoot or watercourse amidships of the boat delayed the escape of the water. One advantage of scuppers in the sides, instead of delivering tubes through the bottom, which is the more usual practice, is that they would not be choked in the event of the boat grounding on an outlying sandbank or on the bar of a river harbour.

The provision for self-righting, namely, good sheer of gunwale and raised air-cases in the extremes, has fully answered its purpose, and the model readily righted itself on being upset. The mode of construction proposed would afford great strength, and it is said to be durable and economical. The detached air-cases also are good, and the slight covering of cork brought over the top of the raised air-cases to protect them from the weight of men jumping upon them, as shown in Plate 2, might be generally adopted with advantage. A passage to within 2 feet of stem and stern is wanting.

The extra buoyancy given to the boat is ample in amount, but its distribution is questionable. As a general rule, extra buoyancy should be placed high in a boat. In the present model 200 cubic feet of air are contained in the bottom under the deck, which is laid at 24 inches above the under side of the keel (or 5 inches above the water-line with 30 men on board), without any ballast to compensate. The centre of gravity, with the crew on board, would thus be thrown so high that the boat would be wanting in stability; and were a sea to break into her, she would be liable to upset. Were this point remedied, which might be done by substituting light cork for some of the bottom air-cases, the boat would make a serviceable boat in such places as the Humber, Bristol Channel, or other rapid tideway.

Henry Hinks, Boatbuilder; Appledore, Devon.

Model and Drawing; scale 1 in. to a foot.

Description.—The midship body of this boat is that of a cutter of a ship-of-war, with ends like a whale-boat, a flat and long floor, breadth carried well fore and aft, sides straight, upright stem and stern, clench-built, of mahogany, and copper-fastened.

Length extreme 30 ft., of keel 27 ft., breadth 9 ft., depth 3 ft., sheer of gunwale 24 in., keel 5 in. deep, and bilge-pieces, rake of stem and stern 3 in. in a foot, with 3 in. camber or curvature. The boat has 6 thwarts, 8 in. wide, 27 in. apart, 10 in. below the rail, and 18 in. above the floor, pulls 12 oars, double-banked, with pins and grummets. A cork fender, 5 in. wide by 5 in. deep, runs round outside at 12 in. below the rail; the boat has a cork sheathing 3 in. thick on her bottom up to the water-line; a gangboard, 6 in. wide, is carried fore and aft the boat amidships on the thwarts; and a grating-flat is laid at 9 in. above the keelson.

Extra buoyancy is obtained by air-cases in the bilge and side, carried on a slope from the main gunwale to the floor, average width 18 in. by 12 in. deep., and air-cases in the head and stern-sheets for a length of 4 ft. to gunwale height, the whole divided into 16 compartments, built into the boat, and to be lined with copper or gutta-percha; also by the cork fenders. Effective extra buoyancy 105 cubic ft., equal to 3 tons. No ballast. Internal capacity of the boat up to the level of the thwarts, 117 cubic ft., equivalent to $3\frac{1}{2}$ tons. Means of freeing the boat of water, by 12 tubes 3 in. diameter each, through the garboard strakes; total delivering area, 72 sq. in., which is to capacity in the proportion of 72 to 117, or as 1 to 1·6. Provision for righting the boat in the event of being upset, consists in raised air-cases in the head and stern-sheets, 4 ft. in length. No rig shown, and no timber-heads for securing a warp to. To be steered by a sweep-oar at either end. Draft of water, with 30 men on board, 18 in. Weight of boat 32 cwt., of gear 3 cwt., total 35 cwt. Would carry 40 persons. Cost, 110*l.*

Remarks.—This boat, from her form, would pull well in all weathers, and sail fast off the wind. She is light for transporting along shore, and yet of sufficient weight to resist and contend against a heavy head sea. The internal capacity of the boat is small, only 3 tons: it might still be reduced with advantage, and the area of the delivering-valves might be increased in order that the boat might free herself quickly in the event of shipping a heavy sea; the gunwale strake, however, being left open, and the inner side of the bilge air-cases forming a fair slope from the floor to the main gunwale, much of the water would roll out from the motion of the boat in a seaway.

The provision for self-righting consists in good sheer of gunwale, raised air-cases at the extremes, and the absence of any flat midship side air-cases, which probably would enable the boat to right herself in the event of being upset; an iron keel of 5 cwt. would make it more sure, and would not add materially to the weight of the boat. All the air-cases are formed in the boat, and therefore would be liable to be stove, but the builder purposes to line them with copper or gutta-percha; the linings will be detached, but it would be better if the cases were so fitted that they could be examined from time to time. A passage should be left in the raised extremes to approach the stem and stern, in case of boarding a wreck end on, which is a common occurrence; and timber-heads for securing warps to should be placed at either end. Were these minor details attended to, the boat would make an efficient life-boat, suitable for many parts of the coast.

Joseph Hodgson, Agent for Lloyd's, Blyth, Northumberland.

Two Models and Drawing; scale 1 in. to a foot.

Description.—The form of this boat is that usually given to a whale-boat, long flat floor, straight sides, in the fore-and-aft direction, raking stem and stern-post, clench built, of larch, and copper fastened.

Length extreme, 31 ft.; length of keel, 24 ft.; breadth, $8\frac{1}{2}$ ft.; depth, 5 ft.; sheer of gunwale, 12 in.; rake of stem and stern, 6 in. in a foot; double keel, 3 in. deep. The boat has 6 thwarts 24 in. apart; the midship thwart 12 in. below the gunwale, and 24 in. above the floor; to pull 10 oars, double banked, with pins and grummets.

Extra buoyancy is given by cork 12 in. deep under the flat, cork at the sides 24 in. deep by 24 in. wide up to the thwarts, and again above the thwarts and in the head and stern-sheets up to the gunwale. Effective extra buoyancy 250 cubic ft. For ballast, metal balls. Internal capacity for holding water 45 cubic ft., equal to $1\frac{1}{4}$ tons. Means of freeing the boat of water by a tube through the bottom, 12 in. diameter; total delivering area 120 square in., which is to capacity in the proportion of 120 to 45 or as 1 to ·4. The provision for righting the boat in case of being upset consists in raised air-cases at the extremities of the boat, and shifting ballast which is so arranged as to roll to one side. There are no timber heads for securing warps to. Draft of water with 30 persons on board, 22 in. Weight of boat 35 cwt.; of gear, 5 cwt.; total 40 cwt. Would carry 45 persons. Cost, 85*l.*

Remarks.—This boat, from her form, would pull and sail fairly. The internal capacity of the boat for holding water is small, and the area of the delivering-tubes ample, and she would readily free herself to the level of her draft. The peculiar feature of the boat is the use of cork throughout to reduce the internal capacity, to give buoyancy, and to obtain righting power. With respect to cork under the flat, nothing can be better, but the quantity used along the sides, and in the head and stern-sheets, would be far too heavy for the boat, even if the lightest cork were used, namely, that at 12 lbs. weight to the cubic foot. It is doubtful if the shifting ballast and raised cork in the extremes would right the boat, in case of being upset, without more sheer of gunwale.

As great difficulty is often experienced in launching a boat on a long flat shore, Joseph Hodgson, of Sunderland, proposes a grapnel and line to be fired out of a mortar, the arms of the grapnel to close up parallel to the shank, until a strain is brought upon them, when they would open out and bite the ground. There is no doubt such a contrivance would be very useful, and several trials of a similar apparatus were made on Yarmouth Beach by Captain Jerningham, R.N., and the Coast-guard, in 1845, with great success.

Willem Van Houten, Rotterdam, President of the South Holland Shipwreck Institution.

Model and Drawing; scale 1½ in. to a foot.

Description. — This model represents a full formed boat, flat floor, straight side in the fore-and-aft direction, ends alike, slight rake of stem and stern-post, clench-built, of oak, and copper fastened.

Length extreme 25 ft., of flat 19 ft., breadth of beam 8 ft., depth 3 ft., sheer of gunwale 12 in., no keel but a flat bottom, rake of stem and stern 9 in. in a foot. The boat has 6 thwarts 9 in. wide, 24 in. apart, 9 in. below the gunwale, and 19 in. above the floor; pulls 6 oars single banked, with pins and grummets. A rope fender is carried round the side at 4 in. below the rail, and life-lines along each bilge; a pump is fitted into the bottom air-case.

Extra buoyancy is obtained by an air-case under the flat 7 in. deep, extending the whole length fore and aft. Rectangular air-cases along the sides 10 in. wide up to the level of the thwarts, air-cases under the thwarts, and in the head and stern sheets up to gunwale height. Effective extra buoyancy, 175 cubic feet, equal to 5 tons. No ballast. Internal capacity of the boat for holding water up to the level of the thwarts, 80 cubic feet, equal to 2⅓ tons. Means of freeing the boat of water by 7 tubes, 3 in. diameter each, total delivering area 45 sq. in., which is to capacity in the proportion of 45 to 80, or 1 to 1·8. Provision for righting the boat in the event of being upset consists in raised air-cases, 2 ft. long, in the extremes up to gunwale height. Rig, one lug sail; to be steered by a sweep-oar at stem or stern. A timber head at each end for securing a warp to. Draft of water with 30 men on board, 18 in. Weight of boat, 20 cwt.; of gear, 5 cwt.; total 25 cwt. Would carry 30 persons. Cost 90*l.*

Remarks.—This boat from her form would pull fairly, and sail well off the wind. She is light for transporting along shore. Would be a good sea-boat, and from her full form and flat bottom, would be easily launched through a surf from a beach. It will be seen by the drawing, Plate 8, that this boat has small internal capacity for holding water, it being well reduced by the air-cases under the thwarts; the number of the delivering-valves, however, might be doubled with advantage, as, with the present proportion of 1 to 1·8, she would take a long time to free herself of a sea that might be shipped.

The boat has ample extra buoyancy, indeed more than is necessary merely as buoyancy, but the nature of it, air, and its position under the flat or deck, are questionable. As a principle, buoyancy should be applied in the upper part of the boat—here a portion of it is in the bottom; it is true that the air-case is only 7 inches deep, but so far it interferes with the stability of the boat; nor is there any water-ballast or iron keel to compensate for it. The air-cases being formed in the sides of the boat-renders them liable to damage when boarding a wreck. The only provision for self-righting, in the event of being upset, consists in the raised air-cases at each end; but this alone would not answer the purpose

It appears that there are several similar boats on the coast of Holland, (some of wood and some of iron,) placed there by the liberality of the South Holland Shipwreck Institution; they are stationed at Scheveningen, Ter Heide, S'Gravesande, Rockange, Brouwershaven, and Zierikzee; or 6 boats in a distance of 30 miles, three on each side of the entrance of the Maas leading up to Rotterdam. It is stated that they are found to answer, and have been the means of saving many lives.

Josiah John Jones, 2, Castle Street, Liverpool.

Two Models and a Drawing; scales 1½ in., 1 in., and ¾ of an inch to a foot.

Description. — This boat has a rising floor athwartships, and a long floor in the fore-and-aft direction, slightly raking stem and stern, no curve in fore foot or heel of post, and to be built of iron. Length extreme, 30 ft.; length of keel, 26 ft.; breadth, 9½ ft.; depth, 4¼ ft.; sheer of gunwale, 23 in.; rake of stem and stern 3 in. to a foot; straight keel, 6 in. deep. The boat has seven thwarts, 16 in. apart, 15 in. above the floor, and level with the gunwale; she pulls 12 oars, double banked, with thole-pins. A fender is placed round the sides 8 in. deep and 3 in wide, at 7 in. below the gunwale. No life-lines fitted.

Extra buoyancy is obtained by an air-case in the bottom amidships under the floor 36 in. wide and 12 in. high; air-cases under the thwarts and round one side of the boat up to the level of the thwarts 12 in. wide and 15 in. deep, the whole divided into compartments and formed in the boat. Effective extra buoyancy, 200 cubic feet, equal to 5½ tons. No ballast. Internal capacity up to the level of the thwarts 61 cubic ft., equivalent to 1¾ tons. The means of freeing the boat of water are by 4 tubes of 5 in. diameter each, total area 72 in., which is to capacity in the proportion of 72 to 61 or 1 to ·84. The provision for self-righting said to consist in water having access to chambers on one side of the boat only. Rig two sprit-sails and a jib; to be steered by a rudder. No timber-heads for securing warps to. Draft of water with 30 men on board 26 in. Weight of boat, 28 cwt.; of gear, 7 cwt.; total weight 25 cwt. Would carry 40 persons. Cost, 100*l.*

Remarks.—This boat, from her form, would pull and sail well, and be a powerful boat under canvas in a strong breeze. If not of greater weight than stated, she would be light for transporting along a beach; her internal capacity for holding water is small, the area of her delivering-valves large, and she would quickly free herself in case of shipping a heavy sea; the partitions, too, between the thwarts would prevent the water rushing fore and aft the boat. The builder states, from the ballast in the bottom and the water admitted into chambers on one side only, the boat would right herself in the event of her being upset; but it may be doubted whether the same cause that depressed the one side of the boat would not keep it so. The deep keel, 6 in., and rising floor, would be inconvenient in launching from, or landing on, a flat beach; the thwarts, only 16 in. apart, are far too close for men to use their oars in a seaway where regularity of pulling cannot be practised; the boat from her deep keel and slight rake of stem and stern, could not be turned quickly to place her end on to a heavy sea. The boat has small capacity for holding water, would readily free herself, and if the water ballast will sufficiently compensate for the weights above being raised by the air-case in her bottom so as to ensure her stability, she might prove a fair life-boat.

The transporting carriage consists of two crutches fitted on springs to the body of the boat, supported on the top of the carriage which stands 2 ft. above the ground.

George Lee, Boatbuilder, Tweedmouth, Berwick.

Model and Drawing; scales 1 in. and ½ in. to a foot.

Description.—This boat has the general form of a north-country coble, with the bow of a whale-boat and a square stern; a flat floor from amidships to the after part of the keel; sides straight, in a fore-and-aft direction; very raking stem and stern; clench-built, of oak and larch, and copper fastened.

Length extreme 39 ft.; length of keel, 24 ft.; breadth, 9 ft.; depth, 4 ft.; sheer of gunwale, 24 in.; rake of stem, 15 in.; of stern-post, 8½ in a foot; depth of main keel, 4 in. forward, diminished to a snape at 4 ft. from the stern-post; side keels 4½ ft. apart, fitted from amidships to the after end of the boat; camber of keel 6 in. The boat has 6 thwarts, 25 in. apart, 7 in. below the gunwale, and 16 in. above the floor; pulls 12 oars, double banked, with pins and grummets. No fender.

Extra buoyancy is obtained by air-cases 9 ft. long in the extremes of the boat for the whole depth; and on the sides up to the level of the thwarts, with the exception of a length of 9 feet amidships. Effective extra buoyancy 180 cubic ft., equal to 5 tons. For ballast it is proposed to admit water into the bottom, and the four tanks fitted for this purpose would contain 6 tons. Internal capacity, up to the level of the thwarts, 180 cubic ft., equal to 5 tons. The means for freeing the boat of water are 8 tubes of 6 in. diameter each, giving an area of 216 square in., which is to internal capacity in the proportion of 216 to 180 or 1 to ·8. The provision for righting the boat consists in the water-ballast and air-cases in the head and stern sheets. Rig not described. To be steered either by a sweep-oar or by a rudder, the heel of which projects 3½ ft. below the keel. A timber head at each end for warps. Draft of water with 30 persons on board 30 in. Weight of boat 25 cwt.; gear, 4 cwt.; total weight, 29 cwt. The boat would carry 60 persons. Cost, 60*l.*

Remarks.—The good qualities of the coble on the north coast of England when employed as a pilot-boat or fishing-boat, and in shallow water, or for landing on, and embarking from, a flat beach, are too well known to require further remark, but it may be doubted whether the form is applicable for the general purposes of a life-boat, either on a flat coast or on any other. There is no doubt but there are instances, as at North Sunderland in 1846, when a simple fishing coble went off and saved life from a stranded vessel at a time when the life-boat stationed there failed in three attempts to reach the wreck. That life-boat, however, was a very imperfect boat, and quite unsuitable for her work; and it is most probable that the fact of the crew being better accustomed to their own boat, and better acquainted with her management in a seaway, had much to do with the result.

The present boat as fitted would not right itself if capsized. The internal capacity of the boat for holding water is greater than is desirable; and although the area of the delivering-valves is large in proportion, a great quantity of water would still remain in the boat; in fact, the water would stand nearly up to the thwarts, with 15 persons in her besides her crew. The great rake of the stem and the camber of the keel would make the boat easy to turn, so as to place her end on to meet a heavy breaking sea; and her light weight would render her easy to transport along a beach. It is on record that 29 lives have been saved by cobles, and doubtless many more; and it is certain that this description of boat has several good qualities, but it cannot be recommended as a suitable form for a life-boat.

George Palmer, Nazing Park, Waltham Abbey, Essex.

One Model; scale 1 in. to a foot.

Description.—The form of the midship body of this boat is that of a whale-boat, with upright stem and stern, rising floor, sides straight in a fore-and-aft direction, clench-built, of elm and fir, and copper fastened.

Length extreme, 26 ft.; length of keel, 24 ft.; breadth, 6¾ ft.; depth, 3¼ ft.; sheer of gunwale, 20 in.; straight keel, 3 in. deep. The boat has 5 thwarts, 24 in. apart, 9 in. below the gunwale, and 22½ in. above the floor; pulls 5 oars, single-banked, with thole-pins. A cork fender, 4 in. wide and 4 in. depth, extends along both sides, close up to the gunwale, but does not reach within 18 in. of the stem or stern.

Extra buoyancy is obtained by detached air-cases of wood, 18 in. square, along the sides, up to the level of the thwarts, and in the bow and stern sheets up to the height of the gunwale, the whole divided into 12 compartments; also by the cork fenders. Effective extra buoyancy, 82 cubic ft., equal to 2⅓ tons. No ballast. Internal capacity up to the level of the thwarts, 62 cubic ft., equivalent to 1¾ tons. No means of freeing the boat of water except by baling. Provision for righting the boat if capsized, raised air-vessels at each extremity. To be steered by a rudder. There are 2 timber heads for warps, one on each bow; wash-strakes round the head and stern-sheets, and life-lines along the gunwale. Draft of water, with 22 persons on board, 15 in. Weight of boat, 10 cwt.; of gear, 5 cwt.; total, 15 cwt. Would carry 20 persons. Cost, 75*l.*

Remarks.—This boat would pull well, is light for transporting along a beach, could readily be manned at any station on the coast, has light draft of water, small internal capacity for holding water up to the level of the thwarts, and detached air-cases, which would preserve them from the risk of being stove alongside a wreck; all of which are good points in her favour. She has timber heads forward for securing a warp to, but none on the quarter, and plenty of life-lines.

The boat would not right herself if capsized, and the raised air-cases at each end would prevent any approach to either extremity within 4½ ft., which might prove extremely inconvenient, in case of having to receive a wrecked crew on board at the head or stern of the boat, which not uncommonly occurs. The boat is narrow for her length, and her rising floor is not favourable for taking a beach.

This model has been generally adopted by the Royal National Institution for the Preservation of Lives from Shipwreck; and several similar boats are, it is believed, placed around the coasts, as in the Isle of Anglesey and elsewhere in Wales, which, it is said, have been the means of saving many lives.

JAMES PEAKE, Assistant-Master, Shipwright in H. M.'s Dockyard, Woolwich.
Model and Drawing; scale 1 in. to a foot.

Description.—The form of this boat is that usually given to a whale-boat, having a long flat floor amidships, sides straight in a fore-and-aft direction, raking stem and stern-post, diagonally built of two thicknesses of rock elm, and copper fastened.

Length extreme, 30 feet; length of keel 24 feet; breadth of beam 8¾ feet; depth 3½ feet; rake of stem and stern-post 6½ inches in a foot; straight keel 4 inches deep; and bilge-pieces with openings in them to lay hold of on each side on the bottom. The boat has 5 thwarts, 7 inches wide, 28 inches apart, 7 inches below the gunwale, and 15 inches above the floors, pulls 10 oars, double banked, with pins and grummets. A fender of cork, 4 inches wide by 2½ inches deep, extends fore and aft at 4 inches below the gunwale.

Extra buoyancy is obtained by cork placed the whole length of the boat, under the flooring, to a height of 12 inches above the keelson, and by light cork or detached air-cases in the head and stern sheets up to gunwale height. Effective extra buoyancy 105 cubic feet, equal to 3 tons. A light water-tight deck will be placed on the cork to protect it, and above that a light grating. For ballast, the weight of the cork in the bottom, and an iron keel of 5 cwt. Internal capacity for holding water up to the level of the thwarts 140 cubic feet, equivalent to 4 tons. The means of freeing the boat of water are by eight tubes of 6 inches diameter through the bottom, and six scuppers through the sides at the height of the flooring, giving a total delivering area of 300 square inches, which is to capacity as 1 to ·5. The provision made for righting the boat consists in the sheer given to the gunwales, raised air-vessels or cork in the head and stern sheets, and the ballast arising from the weight of cork in the bottom, and the small iron keel. A passage, 18 inches wide, up to within 2 feet of the stem and stern is left between the raised air-cases in the extremes, and the top of the cases is protected by a layer of cork. Rig, fore and mizen lug-sail. To be steered by a sweep-oar at either end. Timber heads for warps are placed at each bow and quarter, and a roller for the cable in the stem and stern-post head. A locker under the flooring amidships for the anchor and cable to be secured down to the keelson, and covered with a water-tight scuttle. A life-line fore and aft at a foot below the gunwale, and short knotted life-lines to be hung over the side at each thwart. Draft of water, with 30 men on board, 16 inches. Weight of boat and fittings, 38 cwt. Would carry 60 persons. Actual cost, as built in one of H.M.'s dockyards; materials 40*l.*; labour 45*l.* Total 85*l.*

Remarks. It is anticipated that this boat, from her form, will pull fast in all weathers, and be fully able to contend against a head sea. She would sail well; and from her flat and long floor and straight sides, would have great stability, and prove a good sea-boat. From a slight fulness in her entrance aud flaring bow aloft, she will beach well, and leave the shore through breakers in safety. It is not probable that a boat of this form could be readily upset; but should such an accident occur, the sheer of gunwale, raised air-cases in the extremes, weight of cork in the bottom, and iron keel, would cause her to right herself. The area of the delivering-valves is ample, and the boat would readily free herself of all water above the flooring when she has 30 persons on board. In the possible case of the tubes through the bottom being choked by the boat grounding on a bar or bank, there are sufficient scuppers provided in the side to free the boat of water.

As the greater part of the buoyancy is obtained by cork, all liability to accident is avoided. It is proposed to use light fishermen's cork (of about 12 pounds weight to the cubic foot) for the righting power in the head and stern sheets, if not found too heavy; otherwise detached air-cases, divided into compartments, to be formed of a layer of gutta percha between two thin boards. The diagonal mode employed in building gives great strength; the planks are of one length from gunwale to gunwale, and the keel brought on the bottom, so that if it were knocked away it would not damage the boat.

The builder claims no merit for his design beyond that of having selected the best points from the several models submitted for competition, and having combined them in a form, as shown in Plate 13, which appears to him better adapted for the general purposes of a life-boat than any he has hitherto seen. It is proposed to place the boat, as soon as completed, at Cullercoats, on the coast of Northumberland, two miles north of the entrance of the Tyne, as a station well adapted for testing her capabilities.

James and Edward Pellew Plenty, Newbury, Berks.

Model and Drawing; scale 1½ in. to a foot.

Description. — This boat approaches to the form of a wherry, having great fulness in the midship section near the seat of water extended some distance forward and aft, with a long hollow floor, upright stem and stern-post, clench-built, of oak and arbeal, and copper fastened.

Length extreme 24 ft., of keel 23 ft., breadth 8 ft., depth 2¾ ft., sheer of gunwale 14 in., rake of stern-post 1 in. in a foot, straight keel 3 in. deep, and bilge pieces. The boat has 5 thwarts 28 in. apart, 16 in. above the floor, and 12 in. below the rowlock strake; she pulls 8 oars, double-banked, with thole-pins, and the gunwale or rowlock strake tumbles home to avoid the risk of being carried away.

Extra buoyancy is obtained by air-chambers along both sides fore and aft. formed by a complete casing or inner boat of a triangular shape, extending down to the floor, and coming to a feather-edge at the main gunwale; they are divided into 12 water-tight compartments, each lined with gutta percha, effective extra buoyancy 82 cubic ft., equal to 2½ tons. No ballast. Internal capacity for holding water up to the level of the thwarts, 48 cubic ft., equivalent to 1½ tons. The means for freeing the boat of water are six scuppers, 2 in. diameter each, total area 21 square inches, which is to capacity in the proportion of 21 to 48, or as 1 to 2·3; and, in addition, the upper plank on each side is left out fore and aft, and the inner boat, being of a triangular form and shallow, much of the water would roll out when the boat was in motion in a seaway. There is no provision for righting the boat in the event of being capsized. Layers of cork, averaging 4½ in. in thickness, containing 60 cubic ft., are cemented and firmly secured along the bottom from stem to stern. Rig, one lug-sail, to be steered with a rudder, or a sweep-oar at either end. No timber heads are shown in the model for securing a warp to, but large belaying-pins at each thwart. Draft of water, with 30 men on board, 16 in. Weight of boat 19 cwt., of gear 5 cwt.; total weight 24 cwt. Would carry 35 persons. Cost, if lined with gutta percha, 150*l.*

This boat, from her form, would pull moderately well in all weathers. Her breadth of beam would make her stiff under canvas, and her straight sides and upright stem would make her weatherly, while her weight would enable her to be transported along shore without difficulty. The small internal capacity of the boat is a strong point in her favour; the area of her delivering-valves is limited in proportion to her capacity. The builders, however, state that the valves might be increased in number with advantage, while, from the triangular shape of the inner boat, and the absence of the gunwale strake, much of the water would roll out when in motion in a seaway. The boat would not right herself in the event of being capsized. The air-cases, as in many similar models, are built into the sides and bilge of the boat; but as they are to be lined with gutta percha, they would not be so liable to damage from a blow. There would, however, be a difficulty in getting at them to examine or repair them, which is inconvenient. The cork sheathing would protect the bottom of the boat when landing upon or launching from a stony beach.

It appears that several boats have been built after this model and stationed on various parts of the coasts of England and Wales. According to the printed statement sent by the builders, one of their boats placed at Appledore, on the north coast of Devon, has been instrumental in saving 67 lives; and another, stationed at Skegness, on the coast of Lincolnshire, has been the means of saving 51 lives; and the Inspecting Commander of Coast-guard in that district reports, "The Skegness life-boat has proved herself a good sea-boat, is fast and safe, and is the best life-boat I have witnessed on this long and dangerous coast."

Messrs. Russell and Oswald, Douglas, Isle of Man.

One Model; scale 1 in. to a foot.

Description.—This raft or pontoon has the form of two closed canoes placed parallel to each other at three feet apart, and connected by an open platform; the canoes are clench-built, of elm, and copper fastened. Length extreme 30 ft., of platform 15 ft., breadth of each canoe 3 ft., whole breadth 8½ ft., depth 2 ft., sheer of gunwales 6 in., camber of keel 36 in., depth 3 in. The boat has 5 thwarts 28 inches apart, 10 inches below the gunwale, 14 inches above the platform; to be pulled by 10 oars, double banked, worked in crutches. Fender of rushes; no life-lines; a man-rope with stanchions, 24 in. high, runs round the platform.

Extra buoyancy is obtained by the air-chambers formed by the two closed canoes, which are divided internally into 10 compartments; effective extra buoyancy 150 cubic feet, equal to 4¼ tons. No ballast. No capacity for holding water, as the platform is quite open; the water, therefore, runs out as fast as it comes in. No timber heads for securing a warp to. To be steered by a rudder. Draft of water, with 30 men on board, 18 in. Weight of raft 15½ cwt., of gear 2½ cwt., total weight, 18 cwt. Would carry 40 persons. Cost 40*l.*

Remarks.—This raft or catamaran would pull or sail fast before the wind; but it is doubtful if it could be propelled against a strong head-wind and sea, and whether it could be steered without difficulty. Its easy draft of water adapts it for landing on or launching from a flat beach, and its light weight would facilitate its transport along shore. Rafts or catamarans are much used at Bahia and at other places on the coast of Brazil; and if they can be made manageable and kept under control, they might, under certain circumstances, be useful to bring persons ashore from a wrecked vessel. But it would be attended with some hazard, as the air-chambers, being formed in the canoes, and the material slight, a blow alongside a vessel, or from a broken spar, might stave the side in and entirely disable it; the same accident, of course, might happen to a boat, but a boat would seem much more under command of her crew. A raft, similar to this recorded, has been constructed by the builders, and is stationed at Douglas, Isle of Man, where it is thought much of.

Semmens and Thomas, Boatbuilders, Penzance.

Model and Drawing; scale 1 in. to a foot.

Description.—The form of this boat is that of a whale-boat, long flat floor, sides straight in the fore-and-aft direction, raking stem and stern, clench-built, of oak timbers and Cornish elm planks, and copper fastened.

Length extreme, 30½ ft.; length of keel, 25 ft.; breadth, 7½ ft.; depth, 3¾ ft.; sheer of gunwale, 18 in.; straight keel, 3 in. deep; rake of stem and stern, 8. in. in a foot. The boat has 6 thwarts, 25 in. apart, 7 in. below the gunwale, and 15 in. above the floor; pulls 12 oars, double-banked, with pins and grummets. No fenders. The peculiar feature of the boat consists in having the sides above the deck or flat of the air-cases of open work for a length of 16 ft. by 1 ft. in depth, and the garboard strakes on each side the keel for the same length, also of similar open work.

Extra buoyancy is obtained by air-cases 3 ft. wide and 1 ft. deep in the bilge on each side fore and aft, of fir, built into the boat, but to have detached gutta-percha bags, also by air-cases in the head and stern sheets 5½ ft. long, up to the level of the gunwale, leaving a passage 2 ft. long and 15 in. wide at each end for the steersman to stand in. Effective extra buoyancy 120 cubic feet, equal to 3½ tons. No internal capacity for holding water. Provision for righting the boat, in case of being upset, consists in raised air-cases at each extremity. No ballast. No rig shown. To be steered by a sweep-oar at either end; two timber-heads at head and stern for securing warps to. Draft of water 16 in. Weight of boat, 12 cwt.; of gear, 4 cwt.; total, 16 cwt. Would carry 30 persons. Cost, if lined with gutta percha, 50*l.*

Remarks.—This boat would pull fast in smooth water. She is very light, might be readily transported from one place to another, and her flat floor would enable her to be launched from, or land on, a shallow beach; but it is a question if the boat, if not heavier than the builder states, is not too light to acquire and maintain headway against a strong wind and head sea. She would not suffer from a heavy wave breaking on board, as her open sides and open bottom would enable the water to run off as fast as it came in; but this free access of the water would retard her progress in pulling.

The raised air-cases at each end might cause the boat to right herself in the event of being upset, but it is doubtful whether they would do so without more sheer were given to the gunwale, and some weight in her keel. The passage left in them is very proper; but it should be continued nearer to the stem and stern, in case of having to receive a stranded crew at either end of the boat, which is far from an uncommon occurrence. The air-cases in the bilge and in the extremities, are to have gutta-percha bags in them, making in all 14, which might compensate for the cases not being detached from the side. A boat built after this model might prove an useful boat, but for the general purposes of a life-boat, more beam would be desirable, and much greater strength.

Benjamin Sharpe, Lieut., R.N., Hanwell Park, Middlesex.

Two Models and Two Drawings; scale 1 in. to a foot.

Description.—This model has the general form of a whale-boat, with less breadth of beam, a long flat floor, sides straight, in a fore-and-aft direction, very raking stem and stern-post, clench-built, of elm and ash, and copper fastened.

Length extreme 30 ft., of keel 17 ft., breadth 5 ft., depth 3 ft., sheer of gunwale 24 in., rake of stem and stern-post 12 in. in a foot. The boat has 6 thwarts 8 in. wide, 24 in. apart, 12 in. below the gunwale, and 24 in. above the floor; to pull 6 oars, single banked, with pins and grummets. A fender of cork shavings extends round outside the boat at 6 in. below the gunwale.

Extra buoyancy is obtained by cork alone placed in bundles inside of the boat up to the level of the thwarts, and firmly connected together by a rope, so that in case of need they would form a raft; a space is left for the legs of the rower, and by removing pieces of cork, similar space can be made for passengers; a canvas cover is stretched over the whole. A cone of cork, also, 5 ft. long by 2½ ft. diameter at base, is placed in in the head and stern sheets, rising 6 in. above the gunwale; effective extra buoyancy, 145 cubic feet, equal to 4 tons. For ballast a short flat iron keel of about 1½ cwt. No internal capacity for holding water under the level of the thwarts, and the means for freeing the boat of any water that may lodge on the canvas deck consist in a 5 ft. length of one of the upper strakes on each side amidships being made to open outwards on hinges. Provision for righting the boat consists in the raised cork cones in the head and stern sheets, the small iron keel, and 2 sliding keels, which may be used if required. No rig is shown in the model, nor any timber-heads for securing warps to. To be steered with a sweep-oar at either end. Draft of water 2 ft.; weight of boat 11 cwt.; of gear, 2 cwt; total 13 cwt. Would carry 20 persons. Cost 35*l.*

Plate 10 is the representation of a boat of greater breadth of beam, but showing the same characteristic feature of the cork fittings.

Remarks.—This boat, from her fine lines, would pull fast in smooth water, but in a strong wind and heavy sea, her light weight, raised cones at each extremity, and raking stern would render it difficult to steer her steadily and keep her head to sea. Her lightness, however, would enable her to be readily transported along shore, and easily launched from a flat beach; the raised cones and iron keel would cause her to right herself in the event of being upset, and her short keel and raking stem would facilitate her being rapidly turned to place her end on to a rolling sea.

The characteristic feature of the boat is the inner bottom or filling in of cork by means of which the internal capacity for holding water is got rid of, and its place supplied by a material which combines buoyancy and ballast. If sufficient buoyancy for the purpose of a life-boat can be obtained by means of cork, and no evidence to the contrary has yet been adduced, there is no doubt but that that material is far preferable to air-cases from its non-liability to accident. The best mode of distributing it, however, would require consideration; in the present instance too much is sacrificed to the desire to form a raft which does not appear of sufficient advantage to incur the loss of space for a rescued crew, inconvenience to rowers, &c. The raised cones in the extremities rising above the gunwale are objectionable, as preventing all access to the stem and stern, which it is necessary to preserve, in order to enable the boat to approach a wreck and to receive the crew of a stranded vessel. One important advantage in this mode of fitting by detached pieces of cork, is that it is not liable to injury like air-cases, and that it can be easily applied to a common boat; and much benefit would arise from thus fitting (in a mode adapted to their wants) fishing-boats, coast-guard boats, and any that from the nature of their employment are subject to great exposure to weather and sudden gales of wind.

William Teasdel, Boatbuilder, Great Yarmouth.

Four Models and Four Drawings; scales 1 in. and 5-8th of an inch to a foot.

Description.—The body of this boat is that of a Yarmouth storm-yawl, with extremities like a whale-boat, flat floor, a long straight side, upright stem and stern-post, clench-built, of English oak, with galvanized iron fastenings. Length extreme, 36 ft.; of keel, 32 ft.; breadth, 10½ ft.; depth, 3½ ft.; sheer of gunwale, 21 in.; straight keel, 6 in. deep. The boat has 6 thwarts, 30 in. apart, 6 in. below the gunwale, and 30 in. above the floor; pulls 12 oars, double banked, with thole-pins. A cork fender, 8 in. wide, and 11 in. deep, is carried round the side at 2 in. below the gunwale.

Extra buoyancy is given by air-cases of wood (willow), 30 in. wide and 24 in. deep, all round the sides, up to the level of the thwarts, and again above them to the gunwale, also in the head and stern sheets up to the gunwale, and by the cork fenders. Effective extra buoyancy, 308 cubic feet, equivalent to 9 tons. For ballast, an iron keel of 7 cwt., and metal valves weighing 4 cwt.; total, 11 cwt. Internal capacity of the boat, up to the level of the thwarts, 194 cubic feet, equal to 5½ tons. Means of freeing the boat of water, 10 valves, 7½ in. by 8 in.; total area, 600 in.; which is to internal capacity in the proportion of 600 to 194, or as 1 to ·32. Rig, lug foresail and mizen; to be steered by a rudder projecting 12 in. below keel of boat. Provision for righting the boat in case of being upset consists in the raised air-cases in the extremes and the iron keel. No timber heads for securing warps. Draft of water, with 30 persons on board, 22 in.: with the valves open, 30 in.; equal to 8·5 tons. Weight of boat, 85 cwt., of gear, 10 cwt.; total, 95 cwt. Would carry 60 persons. Cost, with gear, 200*l.*

Remarks.—This would be a powerful boat under canvas; her form and long flat floor would give her stability and make her a good sea-boat; with plenty of hands ready to launch her, there would be no difficulty in getting her off Yarmouth beach; and she would prove a serviceable boat when once afloat and her sails set. The great area of the delivering-valves, in proportion to the internal capacity, would readily free her of all water above 18 in.; but with the valves open, it would not stand at less than that depth.

The boat is intended as a sailing-boat at a particular spot, and for that purpose her great weight may be no objection; but a boat of nearly 5 tons, would be difficult to transport and launch along the greater part of the coast of the United Kingdom, nor would 12 oars propel her against a head-sea in an on-shore gale, even when light, much less so with her valves open, when they would have to give motion to a weight of 8½ tons.

It is highly improbable that such a boat should be upset; but if from any unforeseen circumstance such an accident should occur, the boat would not right herself. The model, although on a smaller scale, is very much that of the life-boats actually in use on the coasts of Norfolk and Suffolk, where it is invariably the practice to go off under sail; and similar boats there stationed have been the means of saving 72 lives within the last five years—40 at Southwold, 19 at Pakefield, and 13 at Caister; so that the boat must be a good sea-boat, and, which is equally important, must be efficiently manned and well managed.

Thomas Waterman, Chief Draughtsman, Admiralty, Somerset House.

One Drawing; scale ½ in. to a foot.

Description.—The form given to this boat is that of a whale-boat, with a moderately rising and long floor, sides straight in the fore-and-aft direction; raking stem and stern-post; to be diagonally built of rock elm, and copper fastened.

Length extreme, 30 feet; length of keel 24 feet; breadth of beam 8 feet 8 inches; depth 3½ feet; sheer of gunwale 16 inches; rake of stem and stern-post 8 inches in a foot; and straight keel 4 inches deep. The boat has six thwarts 30 inches apart, 10½ inches below the gunwale, and 15 inches above the flat, pulls 10 oars, double banked, with pins and grummets. A cork fender 6 inches deep runs round the sides close up to the gunwale.

Extra buoyancy to be obtained by cork or air-cases 10 inches deep under the flat, air-cases 21 inches wide round the sides up to the gunwales, and an air-case 13 inches wide fore and aft amidships up to the thwarts. To be made of yellow pine lined with thin copper, and divided into compartments. Effective extra buoyancy 170 cubic feet, equal to 5 tons nearly. For ballast, cork under the flat. Internal capacity for holding water up to the level of the thwarts 74 cubic feet, equivalent to 2 tons. No means shown of freeing the boat of water. Provision for righting the boat consists in slight sheer of gunwale, air-cases 2½ feet long in the head and stern sheets up to the height of the stem, and the weight given by cork in the bottom under the flat. No rig shown, nor timber heads for securing a warp to. To be steered at either end with a sweep-oar. Weight of boat and fittings 35 cwt. Estimated cost, 90*l.*

Remarks.—This boat, from her form, would pull fast in all weathers, sail well, be stiff under canvas, and make a good and efficient sea-boat. She has small internal capacity for holding water, but no means of freeing the boat in case of shipping a heavy sea. She has ample extra buoyancy, and the cork under the flat fitted close into the bottom of the boat, while serving generally as ballast, would act as buoyancy in case of emergency. It has the further advantage of not being liable to accidents.

The air-case fore and aft amidships under the thwarts helps to diminish the internal capacity; but the side cases should be detached from the boat, in order not to risk being bilged. The short raised air-cases in the extremes, the small sheer, and the absence of weight in the keel, would not allow the boat to right herself, so that, although of as good a form as need be desired for speed and for stability, the boat is wanting in two of the qualities which the Committee consider essential in a life-boat, namely, self-righting power and the means of freeing herself of water.

Messrs. T. and J. WHITE, Ship-builders, Cowes, Isle of Wight.

Model and Drawing; scales 1½ in. and 1 in. to a foot.

Description.—The general form of this boat is that of a whale-boat; a slightly rising floor amidships; sides straight in the fore-and-aft direction; moderate rake of stem and stern-post, carvel built of oak, and copper fastened.

Length extreme, 32 feet; length of keel 27 feet; breadth of beam 8 feet; depth 3 feet; sheer of gunwale 12 inches; rake of stem and stern-post 6 inches in a foot; straight keel 4 inches deep. The boat has six thwarts 30 inches apart, 10 inches below the gunwales, and 17 inches above the flooring; pulls six oars, single banked, in crutches.

Extra buoyancy is obtained by air-cases round the sides 12 inches wide at the thwarts and sloping off to the gunwale and to the floor, and in the head and stern sheets for a length of 5 feet up to gunwale height, the whole divided into compartments and built into the boat. Effective extra buoyancy 70 cubic feet, equal to 2 tons. No ballast. Internal capacity up to the level of the thwarts 105 cubic feet, equivalent to 3 tons. No means of freeing the boat of water. The provision for righting the boat consists in raised air-cases in the extremes for a length of 5 feet. Rig, one lug-sail. To be steered by a rudder. Timber heads for securing a warp to. Draft of water, with 30 men on board, 21 inches. Weight of boat and fittings 30 cwt. The boat would carry 30 persons. Estimated cost, 75*l.*

Remarks.—This boat, from her form, would pull well in all weathers—would sail fairly, and be a good sea-boat. Her moderate weight for her length would render her easy to transport along a beach. The boat has much less extra buoyancy than is usually given to life-boats, yet it is ample for all common purposes; but the air-cases being built into the sides of the boats, renders them liable to be stove in approaching a wreck. The internal capacity of the boat for holding water is not large, but the boat has no means of freeing herself of any sea that may be shipped except by rolling a portion of it out over the gunwales, a measure which is facilitated by the sloping form of the air-cases. It is not probable that a boat of this form would be upset, but should that accident occur there is no sufficient provision for righting herself, as, owing to the small sheer given, the raised air-cases, without any ballast or iron keel, would not effect it. The boat has rather less beam than is usual for the common purposes of a life-boat, but might be well adapted for a rapid tideway, as the Humber or Bristol Channel. A boat of this build is stationed at Broadstairs, on the east coast of Kent, and another at Cardigan, on the west coast of South Wales.

CATALOGUE of LIFE-BOAT MODELS and PLANS submitted to compete for the NORTHUMBERLAND PREMIUM.

NAME OF BUILDER, &c.	Address.	Length.		Breadth.	Depth.	Sheer of Gunwale.	Weight of Boat and Gear.	Number of Oars.	Cost.
		Extreme	Of Keel.						
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Acheson, Joseph† (*Pontoon*)	Leadenhall-street	25	13	6	2½	36	12	4	33
*Ainsworth, John	Bridlington	34	26	8½	4½	36	50	12	70
Anderson, Thos.	Newcastle	31	21	10	4½	30	50	12	84
Anderson, Thos.[a]	North Shields	40	15	11⅝	3¾	24	35	12	120
Angus, F. J.	21, King-street, City-road	30	—	7	2	4	6	12	40
Armstrong, Robt.*[b]	Poplar	36	—	8	4	—	56	12	105
Arrowsmith, C. J.[c]	26, Oyster-street, Portsmouth	30	22	10½	3½	28	32	12	120
Atkinson, J. W.*	North Shields	35	..	12	4	24	60	14	100
Austen, T. F.[d]	Dagleish Street, Limehouse	30	16	9	3½	..	30	12	85
Ayckbourn, F. (*Raft*)	129, Strand	40	—	9	4	—	27	4	50
Baker[e]									
Bastard, Thos.* (*Raft*)	Sheerness Dockyard	25	18	8	4¼	3	..	12	100
Bateman, J., 2 models	101, Upper-street, Islington	22	—	7½	3	—	34	10	120
Bapty, John*	Alloa, Scotland	30	27	7½	3	18	13½	7	30
*Beeching, Jas.[f]	Great Yarmouth	36	31	9½	3½	36	67	12	250
Bee, Benj.	Hull	35	23	9	4	42	46	10	120
*Bertram, Jas.	East-street, Manchester-square	30½	25	9	3	12	29	8	90
Bewley, Thomas	Setmurthy, Keswick	29	15	10¼	4½	—	40	12	50
Bettridge, R.[g]	41, Milton-street, Dorset-square	..	..	..	..	..	..	..	..
Bell, Andrew	Buckhaven, Fife, N.B.	32	30	10½	4¼	24	40	12	90
Bell and Smith	Baltic Wharf, Millbank	26½	15¼	7½	3	24	42	10	100
Besant, C.	Weymouth	24	18	7	4	9	7	10	30
*Birch, B.[h]	14, Military-road, South Shields	34	28	11¾	3¾	27	50	14	180
*Blair, Robert	South Shields	35	25	12	4½	33	97	14	195
Blackwell, J. C.	Leith (Menzies and Co.)	30	—	8	4	—	—	10	70
Bonney, W. W.†[g]	Claremont Villa, Fulham	30	25½	8	3	18	30	10	..
Bosch, P. van den	Oosterhout, Netherlands	24	—	4¼	2	—	4¼	3‡	5
Bowlt, S., 3 models	Church-walk, Gateshead	32	28	10½	4	48	45	10	158
Brady, J.	1, Chancell-street	21	—	7	—	—	—	—	—
Bremner, James, *C.E.*‡ 2 models, and carriage.	Wick, Caithness	33	—	12	3½	36	36	—‡	160
Brideson, W.	Neptune-street, Liverpool	32	23	8	4	24	—	12	—
Brisbane[g]	Dundee	..	..	..	..	..	..	..	..
Bromley, Gilbee[i e]	Sheerness	32	32	7	3	12	25	16	76
Brown, Charles[g]	10, Blomfield-terrace, Harrow-rd.	..	..	..	..	..	..	..	..
Brown, Thomas.	Kirkhampton, Carlisle	28	23½	8	4½	48	30	6	40
Browne, J. Harcourt†	Moorgate-street	23	18	6½	3½	36	5	4	80
Bullock, F., Capt., *R.N.*[j]	Woolwich	..	..	..	..	..	..	..	..
Burcham, Chas.†	Heacham, Norfolk	30	—	10	4	—	9	6	26
Bush, W. *C.E.*	22, Abchurch-lane	30	23	7	3¼	40	31	10	122
Burgess, Capt., *R.N.* (*Plan*)	Stourscombe-house, Launceston	30	24	8½	5½	48	..	8	..
Cambridge, William[k]	Filey, Yorkshire	31	24	10	3	31	39	10	115
Campbell, S.	Milburn-place, North Shields	30	20	9	4¾	20	27	20	92
Carmichael, J.	William-street, Workington	30	—	4	5	36	40	20	100
Carter, A.[l f]	Langley-place, Poplar	32	29	7½	5	13½	38	10	75
Carr, C	3, Dorset-street, Commercial-rd.	30	20	8½	5	24	29	10	90
Carr, Balleny (*Plan*)[m]	Newcastle	38	14	15½	6	54	..	16	..
Coryton, J.*[n]	Erechtheum Club, St. James's	36	—	10½	3½	—	20	—	80
Chalklen, F.[g o]	10, Rodney-street, Pentonville	..	..	..	..	..	..	..	..
Christophers, J.*	Heavitree, Devon	42	—	7	3½	9	105	12	105
Clarkson, T. C.[p]	111, Strand	30	20	7¾	3	19	12	8	80
Cockey, John, jun.[q]	Portsmouth	32	30½	10¼	4	24	29	12	110
Cock, J.	Pembroke	25	—	7	1½	8	12	14	28
Cooper, W.[g]	52, Newborough, Scarborough	30	30	8	5½	15	38	8	100
Cooke and Hawkes†	39, Broad-street, Birmingham	18	18	5½	4½	—	5	4	65

* Of iron. † Gutta percha. ‡ Propelled by paddle-wheels.

The * before name implies that the model is described in detail.

[a] Closed water-tank; an air-case at the side, up to gunwale height, which is to fill with water by a self-acting valve if the boat should be upset. Built the present boat at North Shields.

[b] Air-case 2 feet deep under flat, and water ballast.

[c] Packed with cork; area of delivering tubes 126 square inches, 2 cwt. of lead on keel; amidship wash board runs fore and aft.

[d] Air-case in the bilge, and in the ends up to gunwale height, water tank under flat; and in the sides from thwarts to gunwale with a pipe to convey water from lower to upper tank when needed.

[e] Model of a self-acting valve for life-boats.

[f] Water Ballast.

[g] Mode of giving extra buoyancy, applicable to ordinary boats.

[h] Scuppers on each side on level of flat.

[i] Cork and air quartered alternately under the flat.

[j] Description of a safety raft, to be made out of the moveable bridge of a steamer.

[k] Life-boats by this builder, placed at Riga and at Hartlepool, are said to have saved 69 lives.

[l] Air-case 2 feet deep under flat, under thwarts, and at ends; 1 ton of water-ballast; area of delivering-tubes 60 square inches.

[m] A full-formed round boat, diagonally built; rake of stem and stern-post 13 inches in a foot; five round shot in bilge to roll from side to side against a spiral spring; air-tubes at the side fore and aft, from thwart to gunwale.

[n] Propelled by exhausting air.

[o] An air-tight tube suspended outside on each side of boat.

[p] Of gutta percha, cork, &c., combined.

[q] A good pulling, and fair sailing boat; side scuppers to free her of water.

Catalogue of Life-Boat Models and Plans submitted to compete for the Northumberland Premium—*continued.*

NAME OF BUILDER, &c.	Address.	Length.		Breadth.	Depth.	Sheer of Gunwale.	Weight of Boat and Gear.	Number of Oars.	Cost.
		Extreme	Of Keel.						
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Cormack, A.	Wick	30	18½	9½	4½	28	30	10	100
*Costain, Thomas	Liverpool	30	27	9½	4	18	37	12	129
Cotter, J. B.	3, Trinity-place, Charing-cross.	32	..	9	4½	..	7	10	85
Croad, Richard	Deptford.	26	12	9¾	5½	19	25	8	36
Crocker, John	Bude, Cornwall.	30	23	8½	4	18	..	14	..
†Crozier, W..	Merchants' Room, Lloyd's.	35	26	12	3½	24	..	10	..
Dalmeyer, C.[a]	Texel	..	..	..	..	..	..	..	..
Davison, Bartholomew[b].	Swansea.	32	28	9½	4½	36	41	14	130
Davidson, J.[c]	Northumberland-street, Blyth	29½	16	8½	5½	19	..	12	..
Davis, J. G.[d]	Worcester	25½	8	4	2¾	21	..	6	..
Davis, W. B.‖[e]	Godfrey-street, Southampton	36	32	10	5	12	15	14	85
Davy, F. (*Raft*)	Regent-street, Northampton	17	—	3	1¾	—	—	10	..
Deans. W.	Wapping	36	..	12	6	36	50	12	80
Dickie, D.[f]	Dundee	24	17	7	4	12	25	14	95
Dockar, William (*Raft*)	Gillyhill, Banff	42	—	14	3	—	26	12	90
Doherty, A.	Rutland	26	24	6	2¾	18	20	8	32
Donaldson, Rich.[g h]	Tyne-street, Newcastle	30	20	10	4	36	30	10	110
Dowey, J.	North Shields	36	21	12	4	20	39	18	75
Druery, J.*	Hartlepool	31	17	10½	7½	18	95	16	200
Dyne, William[i]	Mansfield-street, Kingsland-road	30	24	9¾	4½	18	25	12	120
*Edmond, John (coble), 2 models.	Scarborough	27	—	7½	3¾	16	23	8	53
Edwards, James[j h]	Pembroke Dockyard	27½	26	6½	2½	24	16	6	38
Edwards, J.	Stourbridge	25	—	5	4	—	—	8	105
Erskine, Daniel, 2 models[k]	Edinburgh	27	22	8½	3¾	6	40	10	117
Evans and Jones[l]	Port Madoc	28	23	6½	3¾	21	12½	10	50
*Falkingbridge, William.	Whitby	35½	29	8½	3½	27	47½	14	115
*Farrow, George[h]	South Shields	30	22	10	3¾	24	50	10	130
Fawcus, G.	North Shields	30	24	10	3½	20	38	24	92
Fife and Son, 2 models[m]	Fairlie, Ayrshire	28	14	7½	3	24	32	10	63
Forrest and Laurie[n]	Norway-yard, Limehouse	32	26	9	3½	28	21	8	100
Forster, J.* (*Plan, Raft*)	14, Buckingham-street, Strand	30	—	7	1	—	17	6	70
Forster, J. T., *R.N.*[o]	Streatham								
Francis, Joseph, 3 models	New York, United States	27	22	7	2½	27	19	6	45
Freeman, J.	Monkwearmouth	32	—	10	4	18	40	14	—
Frearson, M. (*Plan*)	20, Westbourn Park-road	..	..	..	..	..	..	..	..
Fry, Thomas[p]	Tynemouth	40	28	13½	4	48	40	12	100
*Gale, John and Robert	Whitby	30	18	11	3½	30	28½	10	105
Gale, T.‡ (*Raft*)	10, Church-street, Hull	27	—	13½	4	—	66	14	100
Gale, G. Hamlyn[q]	Swansea.	30	24	8	3½	24	10	12	100
Gardner, H.[r]	3, Essex-street, Islington	30	—	3¾	3½	—	20	6	20
Gaze, Thomas[s]	Mundesley, Norfolk	30	27	10	4½	26	42	10	130
Gilley, —	Torquay.	24	13	5¾	1½	—	—	10	—
Glazebrook, J. G.*	Chester	27	20	6½	3	—	17	6	70
Godfrey, W. D., 3 models‡	Romford.	20	—	5	3	—	3½	—	22
Goodridge, W.[t]	Swansea.	30	23	9	4	24	37	8	105
Goodwin, Charles	11, Bow-lane, Poplar	26	22	6½	2¾	18	20	6	70
Gower, C. F.[u]	Nova Scotia House, Ipswich	31	19	6¾	3½	12	40	6	70
Grant, Wm. (double boat)	Southsea.	25	20	7¾	2½	18	21	10	70
*Greener, William	Aston New Town, Birmingham	37	29	12	2½	24	32	16	150
Gregory, J.‡	Broadwall, Stamford-street.	30	22	8	4½	18	16	6	50

* Of iron. † Of gutta percha. ‡ Propelled by paddles. ‖ Rattan cane, vulcanized India-rubber, or American packing.

The * before name implies that the model is described in detail. † Not to compete for premium.

[a] Suggestions for signals, life-buoys, cork jackets, &c., with sketch of life-boat.

[b] Air-case under flat; and water-ballast about 1 ton.

[c] Air-case under flat, and at ends; area of delivering-tubes 96 square miles.

[d] Air-tight deck 30 inches above keelson, gutta-percha tube fenders.

[e] Of wicker-work.

[f] Mode of giving extra buoyancy, applicable to ordinary boats.

[g] An open well for water-ballast.

[h] Water-ballast.

[i] Water admitted on one side; a perforated zinc bottom.

[j] 15 cwt. of water-ballast; a suspended weight; raised air-cases in the extremes; ample side scuppers.

[k] One model propelled by wheels.

[l] Sliding keel.

[m] One model like a double canoe.

[n] Air-cases under the flat, and on each side, and in the ends up to gunwale height; traversing ballast, in the event of the boat being upset, and an iron keel; also a self-acting valve to admit water into the side air-cases if upset; and eight self-acting float-valves in the bottom for the escape of water.

[o] Air-tight cases of wood, and gutta percha between the boards.

[p] Air-cases under the platform, and in the ends and amidships up to gunwale height; water-ballast; side scuppers; gutta-percha fenders.

[q] Hydrostatic apparatus for delivering water, applicable to ordinary boats.

[r] Of wicker-work covered with canvas, to be rolled along the beach to the site of the wreck and then opened out into a boat.

[s] Effective extra buoyancy 250 cubic feet, or 7 tons, including air-case under flat 2 feet deep; 2 tons of water-ballast; two pumps; side scuppers with ample discharging area.

[t] Air-cases under the flat 12 inches deep, in the sides and ends sloped up to gunwale height; and gutta-percha tubes; area of delivering-valves 120 square inches.

[u] Air-cases of gutta percha in the body of the boat, and at ends.

Catalogue of Life-Boat Models and Plans submitted to compete for the Northumberland Premium—*continued.*

NAME OF BUILDER, &c.	Address.	Length.		Breadth.	Depth.	Sheer of Gunwale.	Weight of Boat and Gear.	Number of Oars.	Cost.
		Extreme	Of Keel.						
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Grellier, F.	St. Hellier, Jersey	30	23	7½	3½	12	24	12	75
Gullen, W.[a]	Wallsall	18¼	16	5½	4½	—	—	6	—
*Gurr, Charles	Portsea	30	21½	7½	3	19	37	14	80
Hale, J. W., 2 models[b c]	Lloyd's, Royal Exchange	30	—	9	3½	—	40	12	120
Hall, R.	Green-court, Newcastle	31	—	9	4	—	22	20	120
Hall, W. (double boat)*[d]	Hartlepool	16	—	4½	2	18	30	—	80
Hall, A., and Son[e]	Aberdeen	33½	—	8½	4	—	35	—	150
*Harding, J. & J., 2 models[f]	Whitby	30	16	10¼	3¾	36	32½	12	100
Harford, H.	21, Ocean-place, Kingston, Hull	20	10	7½	4½	24	19½	10	125
Harland, E. J.§[g]	Scarborough	32	28	8	3½	12	60	—	150
Harrison, E. L.	Barking	32	—	16	5	15	70	10	90
*Harvey, T., and Son[c]	Ipswich	41	36	11	4	24	45	12	200
Hatt, Cyprian	Lowestoft	35	—	12	4½	18	95	16	260
Hawks, W. R. (double coble)[h]	Plantation House, Robin Hood's Bay.	27	—	9	4½	18	35	12	55
Hawksey, A.	St. Helen's, Lancashire	26	22	9	3	12	30	8	130
Hawkesworth, Amory[i]	Grosvenor-basin, Pimlico	36	30	7	7	—	47	16	200
*†Hay, Commodore Lord John	Devonport	32	24	7½	3½	25½	32	14	70
Hay and Hunter§	Hartlepool	28	14	8	5½	18	19	10	100
Haysome, F.‡	15, Belgrave-terrace, Pimlico	—	—	—	5	—	16	7	120
Hely, A. A.[j]	16, Manchester-buildings	27	—	8	4	12	—	6	—
Hedgcock, Thos., *R.N.*[k]	3, Hale's-place, South Lambeth	27	21	7	3½	12	22	8	50
Hewes, J. T. (*Raft*)	129, Strand	40	—	10	5	—	15	10	50
*Hinks, Henry	Appledore, Devon	30	27	9	3¼	24	35	12	110
Hitch, C.		25½	24	6	3¼	—	—	—	—
Hodgson, J., 2 models[l]	Blyth, Northumberland	31	24	8½	4¾	16	36	8	100
*Hodgson, Joseph	Sunderland	30	25½	8½	3¾	24	40	14	52
Holbrook, J. N.*	Nottingham	30	—	10	3	24	26	18	350
Hollands, W. E., 2 models (*Rafts*).[m]	10, Eastern-place, Brighton	26	19	8½	3	25	..	..	..
Holmes, J.*[n c]	2, Mile End-road; South Shields	30	20	10	4¾	36	44	16	140
Hoskins, J.	31, Frith-street	30	28	10	—	9	22	10	40
Hough and Hartley	8, Brief-street, Manchester	24	19	5	2½	9	8	8	80
*Houten, W. Van	Rotterdam	25	19	8	3	12	20	6	90
Hughes, Geo.	Penzance	25	16	3¾	3	24	39	12	90
Hughes, John	Sunderland	30	19	12	5	18	36	8	140
Hunt, J. (cylinder)	Lichfield	32	—	9½	4½	—	—	—	—
Hunter and Hay	Hartlepool	28	14	8	5½	18	19	10	100
Husband, S. O.	Anderton's Hotel, Fleet-street	26	22	9	3½	—	30	12	100
Inglefield, Commr. E. A., *R.N.* (*Plan*)[o]	Portsea-place, Connaught-square	24	17	7	3	36	—	8	—
Inglis, J., *M.D.*[p]	Green Royde, near Halifax	31	15	9	6	18	..	12	..
Jackson, H., 2 models	62, Westbourne-street, Pimlico	30	—	9½	6	—	28	10	..
Jennings, H. W., 2 models	6, Spa-terrace, Bermondsey	26	18	9½	4½	24	30	8	90
Jermyn, J. W.	Kenmare, Ireland	32	28	11¼	5	24	—	10	—
Johnston and Haines	Barrington House, Ryde	30	27	8	4	42	25	12	100
*Jones, Josiah John[q]	2, Castle-street, Liverpool	30	26	9½	4¼	23	25	12	100
Kemp, Thomas[q]	Woolwich	25	20	7½	4	6	32½	12	—
Kemp, Robert	35, Temple-street, Southwark	26	20	10	9½	—	30	8	105
Knell, J. G.*	26, Popham-street, Islington	29	—	6	5	54	—	8	70
Lassalle, W. H.[r]	Berkeley-court, Clifton	..	..	..	..	..	..	..	..
Lawley, J.	5, Norway-place, Commercial-rd.	30	27	10	4	3	25	10	75

* Of iron. ‡ Propelled by paddle-wheels. § Copper.

The * before the name implies that the model is described in detail. † Not to compete for premium.

[a] One model propelled by wheels.

[b] Circular bottom, gutta-percha tubes fore and aft, 3 feet above the gunwale.

[c] Water-ballast.

[d] One boat suspended within another, propelled by a screw worked by six men.

[e] Straight side, fine lines; air-case in bilge, and raised air-cases in the ends; well amidships; cork fenders 6 inches thick and 30 inches deep.

[f] One model of a double boat, one suspended within the other.

[g] Screw propellers worked by ten men.

[h] Central air-case under the flat 15 inches deep, and 5 feet wide, from flat to thwarts 12 inches deep by 15 inches wide, and in the ends up to gunwale height.

[i] Air-case 33 inches deep under the flat; cork bilge pieces 12 inches thick; and a leaden keel. Models of pump and self-acting valve.

[j] Built of tubes.

[k] Arched deck to prevent foundering.

[l] A fair pulling and sailing boat, cork under flat, on each side up to level of thwarts, and in ends up to gunwale; shifting ballast.

[m] Tubes to be filled with hydrogen.

[n] Air-cases under the flat, and in extremes; and water-ballast.

[o] Of wood framing, gutta-percha lining, and planking; air-cases in the bilge, and ends filled with cork shavings; an iron spring keel; carriage wheels to fix on axles secured under two thwarts, to be detached by a lever when the boat is launched.

[p] Air and water compartments under flat, and air-cases under thwarts. Also a brief history of life-boats.

[q] Air under flat, and round one side on top of flat; escape tubes in the bottom.

[r] Extra buoyancy applicable to ordinary boats.

Catalogue of Life-boat Models and Plans submitted to compete for the Northumberland Premium.—*continued.*

NAME OF BUILDER, &c.	Address.	Length.		Breadth.	Depth.	Sheer of Gunwale.	Weight of Boats and Gear.	Number of Oars.	Cost.
		Extreme	Of Keel.						
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Laurie & Forrest	Norway-yard, Limehouse	32	26	9	3¼	28	21	8	100
*Lee, George	Tweedmouth	39	24	9	4	24	..	12	60
Lewis, W.	38, Broomielaw, Glasgow	22½	—	5½	4	18	32½	6	70
Light, Edward[a]	Wapping	30	26	7½	3½	30	16	12	60
Lindsay, Edwd.	Belfast	26	23	8	4	—	—	—	—
Lindsay, M.[b]	Eyemouth	30	22	7¾	4	18	50	12	65
Lister, John[c]	Holmes-lane, Sunderland	37	29	8	5	18	35	16	130
Lister, William[d]	Bishopswearmouth	30	—	9	4¾	27	37	10	50
Littlejohn, Robt., and Son[e]	Spittal, Berwick	30	17	8½	3½	34	—	10	—
Lomax, W. R., *C.E.* (*Raft*)	Hertford-terrace, Uxbridge	37	—	9½	5½	—	35	6	50
Lyon, Geo.	Portsmouth-yard	24	22½	6½	3¾	—	24	12	69
Maberly, Rev. F., 4 models[f]	Stowmarket, Suffolk	26	—	10	5½	—	30	—	70
Macintosh, J.[g]	35, Newman-street	..	..	..	..	..	..	..	..
Macrae, Rev. J.	Glenelg Manse	28	—	7½	5	6	44½	—[h]	65
McDougall, John[i]	Kelso	30	30	10	3¾	—	24	16	90
Male, John	12, Gray's Inn-square	36	—	4½	..	..	..	..	..
Manning, A. (*Raft*)	(Noulton and Wyld) Lambeth	26	21	14	3¾	—	9	8	50
Martin, John*[j]	Lindsey House, Chelsea	40	24	8	4½	—	10	..[j]	49
Martin, W.	Inverkeithing, N.B.	30	20	9½	3¾	42	44	10	100
Mason, E.	38, Exeter-street, Chelsea	21	5	5	2	12	17	6	57
Maskell, W.	20, Duke-street, Chelsea	31	21	5½	5	18	29	9	100
May, C.	37, Cotton-street, Poplar	33	26	8½	—	14	34	14	60
May, J.	Pembroke Dock-yard	30	25	6	3	18	9	10	50
Milburn, George, 2 models	Blyth, Northumberland (coble)	37	—	8	6	—	—	6	—
Mills, J.	Deptford	27	24	8½	3¾	3	32	8[f]	90
Mitchelson, W. J.*	Dean's Moss, Macclesfield	22	20	8½	4	24	—	8	—
Monzani, W.[k]	17, High-street, Camden-street	25	20	8	1¾	24	14	8	75
Morland, W.	Rotherhithe	30	19	10½	3	24	35	12	90
Morris, John[l]	Pembroke Dock	30	15	6½	2½	18	12	6	54
Munro, A.	Tamworth	20	15½	6½	3	—	—	4	—
Murray, A. G. E., Lt., *R.N.*[m]	Northolt, Hanwell, Middlesex	31	—	12	5	27	15	12	100
Murray, Dr. (letters)[n]	Broadstone, Stranraer	..	..	..	..	..	..	..	..
Myers, W. S.*	7, Garden-street, Sheffield	30	26	8	6	—	—	—[h]	—
Neill, W.*†	1, Mintern-street, Old Hoxton	13	—	7	6	12	23	6	84
Ombler, W.	8, Albert-street, Hull	30	20	9	3¾	18	40	8	90
Orton, Reginald[o p]	Bishopswearmouth	26	—	6	2½	—	10	—[p]	80
Palmer, W. Vaughan†[q]	93, Charrington-st., St. Pancras	..	..	..	..	..	..	..	..
*Palmer, George	Nazing-park, Essex	26	24	6¾	3½	20	15	5	75
Parker, W.	Palace-row, Worcester	24	—	7½	3½	54	6	8	50
Paterson, Rev. Dr., 3 models (cylinders—*Raft*).	Glasgow	26	—	6½	3½	6	27	8	90
Patterson, William[r]	Wapping Dock-yard, Bristol	35	33	9½	3¾	24	42	10	90
*†Peake, James	H.M. Dock-yard, Woolwich	30	24	8¾	3½	25	38	10	..
Pearson, R.	Liverpool	30	28½	—	5	9	45	8	77
Perceval, Hon. and Rev. A.[s]	Bookham, Leatherhead	25	—	8	2¾	—	12	10	80
*Plenty, Jas. and Ed. P.	Newbury, Berkshire	24	23	8	4	24	24	8	150
Poad, F.*	South Shields	34	—	9¾	5	36	40	14	90
Potts, James	Ponteland, Newcastle	40	—	12	7½	24	83	20	—
Potts, Thomas	Bishopswearmouth	39	18	10	3½	30	85	16	150
Poulson, Ebenezer[t]	Bridge-street, Sunderland	30	27	8	5	—	24	8	80
Preston, T., Lieut., *R.N.*, 2 models.[u]	Lowestoft	40	39	12	3	18	195	17	260
Rawson, John	Bury, Lancashire	24	—	9	4	3	—	10	120

* Of iron. † Gutta percha.

The * before the name implies that the model is described in detail. † Not to compete for premium.

[a] Buoyancy by dried rushes.
[b] Air under flat, round the sides and ends; eight delivering-tubes on the side.
[c] Paddle-box boat; closed water-tank; air-boxes at sides and ends to gunwale height; side scuppers.
[d] Air-cases under the flat and in ends; side scuppers.
[e] Air-cases under flat and in ends; water-tank and freeing tubes.
[f] Propelled by wheels.
[g] Supposed self-righting apparatus applicable to ordinary boats.
[h] Screw-propeller worked by men.
[i] A shifting iron keel.
[j] Propelled by a fishtail.
[k] An iron lee-board acting as ballast.
[l] Water-ballast.
[m] Flat bottom; air-case under deck, and in ends up to gunwale; a midship partition.
[n] Inventor of the shipwreck arrow.
[o] Bottom of boat open.
[p] Propelled by paddles.
[q] Principle of righting by means of water applicable to ordinary boats.
[r] To be diagonally built; air-cases under the flat, divided into compartments; no ballast; valved scuppers in the side.
[s] A raft supported by cylinders of gutta percha.
[t] A self-acting gutta-percha cylindrical outrigger 9 feet long on the gunwale on each side amidships; four wheels or rollers 12 inches diameter in keel to facilitate launching.
[u] A model of a self-acting value, and of an enlarged air-tube.

Catalogue of Life-Boat Models and Plans submitted to compete for the Northumberland Premium—*continued.*

NAME OF BUILDER, &c.	Address.	Length. Extreme.	Length. Of Keel.	Breadth.	Depth.	Sheer of Gunwale.	Weight of Boat and Gear.	Number of Oars.	Cost.
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Remington, G., *C.E.*[a]	Warkworth	40	36	8	6	9	300	—	500
Richards, J.	Ferryside, Swansea	30	26½	8	3	15	26	12	90
Richardson, H. T.	Aber Hirnant Bala	33	—	7	—	—	20	16	70
Riedenberg, A.[b]	Groningen, Netherlands	15	—	8	5	—	—	—	—
Robinson, Alexander[c]	Hartlepool	34½	19	10¾	3½	30	34	12	80
Robinson, W. W.[d]	Hartlepool	36	28	12	4	48	46½	10	80
Robinson, J.[e]	Stepney	..	..	..	..	..	..	..	..
Robinson, Daniel[f]	Gosport	30	24	7¾	4	18	17	8	85
Rogers, H.	Lower Appleby, Huddersfield	24	19	5¼	4¼	9	45	14	48
Rowlands, J.*	Soughton-Northop, Flint, N. W.	20	10½	6½	3½	18	—	8	—
*Russell and Oswald (*Raft*)	Douglas, Isle of Man	30	—	8½	2	6	18	10	40
Sage, George[g]	Bermondsey	..	..	..	..	..	..	..	..
Sands, Thos.[h]	Winterton	..	..	..	..	..	..	..	..
Sanderson, G. T. (*Raft*)	1, Park-place, Knightsbridge	30	—	12½	7½	19	—	12	—
Sanderson, T., 4 models*[i]	Nile-street, Sunderland	34	24	9½	4½	24	44	14	125
Saxby and Brain	Bonchurch, Isle of Wight	30	20	7	4¼	16	22	6	105
Sayer, Geo., Commr., *R.N.*[j]	Statenborough House, Sandwich	..	..	..	..	..	..	..	..
Schaw, Alex., (*Plan*)	Windsor-hill, Newry	22½	—	7¼	2½	—	20½	6	30
Scott, John[k]	South Shields	35	26½	11¼	4	30	80	12	150
*Semmens and Thomas	Penzance	30½	25	7½	3¾	18	16	12	50
Severn, Henry A. (*Raft*)	James-street, Buckingham-gate	30	27	8	4½	6	46	12	104
Simons, W.*	Greenock	30	—	9	3	18	50	10	100
Simons, S.	Cromer	32	23	12	4½	30	57	16	150
Sinclair, Duncan[l]	122, Oxford-street	32½	24	11	4⅛	8	40	10	80
*Sharpe, Benj., Lieut., *R.N.*	Hanwell Park	30	17	5	3	24	15	6	35
Shaw, T. (cylinder)	3, College-st, Upper Thames-st.	32	—	6½	4	—	30	8	—
Skiers, Ed., *M.D.*[m]	Paris	..	..	..	..	..	..	..	..
Skinner, John[n]	Aberdeen	35	—	9	3¼	21	37½	8	98
Slater and Wright, 2 models[o]	Whitby	30	18½	8	5½	18	40	10	90
Slotter, D.[p]	18, Mitre-street, Blackfriars-rd.	30	—	5¾	3	12	—	6	—
Smales, Thos.	Whitby	35	—	13	4	18	38¾	14	95
Smith, Ed., Commr., *R.N.*[q]	Greenwich	..	..	..	..	..	..	..	..
Smith, W. A.[r]	Kirkaldy	34	18	10	4½	42	54½	12	100
Smith, J.	Edinburgh	28	19	7	6	12	—	—	—
Smith, M.	Monkwearmouth	27¾	—	8½	3½	16	30	14	120
Sole, G.§	Dock-yard, Sheerness	30	27	8¾	3½	10	25½	12	85
Sparke, William, 2 models[s]	Exeter	39	35	7½	3½	9	50	14	60
Sparrow, A.	Wexford	33½	—	7¼	3¼	19	30	8	38
Stewart, D.	Gatehouse of Fleet, Galloway	30	20	9	3½	30	35	10	70
Stevens, W.	Guildford-street, Russell-square	23	17	8½	3¾	18	10	8	50
Strawson, E.*	59, Tottenham-court-road	16	11	4½	4	—	40	—[b]	80
Sutton		..	..	..	..	..	..	..	..
Swallow, J.	Whitby	..	..	..	4½	18	33	14	100
Symons, H.	New Quay, St. Colomb.	32	30	7½	3½	18	28	14	128
Tate, Clement[t]	Newcastle	34	24	12	4	24	35	14	—
Taylor, Francis, 6 models[u]	Leith, Scotland	45	30	4	3¼	30	—	12	—
Taylor, Robert*[v]	Queen's Head-close, Newcastle	36	—	12	3¾	28	—	—	—
Teasdel, W., No. 1	Great Yarmouth	42	37	11½	3¾	20	98	14	260
,, No. 2	,,	32	27	10½	3	20	79	12	180
* ,, No. 3	,,	36	32	10½	3⅓	21	95	12	200
Temple, W.	Swainston Bridge, Liverpool	27	22	7½	3¼	24	11	2	—

* Of iron. † Of gutta percha. § Of copper.

The * before the name implies that the model is described in detail.

[a] Screw-propeller worked by a steam-engine of 10 horse power.

[b] Propelled by paddles.

[c] The bows of a coble, flat floor, sides round; air-case under flat 18 in. deep; extra buoyancy 500 cubic feet, equal to 15 tons; internal capacity 210 cubic feet or 6 tons; area of discharge 48 square inches, or as 1 to 4. Raised air-cases for righting boat 2 feet above gunwale, at 5 feet from stem and stern; no ballast.

[d] A long flat floor, round sides; air-case under flat 20 inches deep, on the sides, and in the ends; extra buoyancy 900 cubic feet, equal to 26 tons; internal capacity 120 cubic feet, or 3½ tons; area of discharge 48 square inches, or as 1 to 2·5; a well for 28 cwt. of water ballast. Boat would pull well, but not steer well.

[e] Five models illustrating principles of self-righting.

[f] Water-ballast; air-cases in ends, and a water-course or shoot, 6 inches diameter, at each end between air-case and stem and stern-post. A fair boat.

[g] Principle of righting by means of water applicable to ordinary boats.

[h] Life apparatus, in the form of a hollow India-rubber buoy.

[i] Air-cases round the sides, water-ballast, side scuppers and tubes in bottom.

[j] Buoyant principle, applicable to ordinary boats.

[k] Water-ballast.

[l] Three keels, main keel of iron; external air-vessels of leather; when folded to form a fender; air-case under flat.

[m] Suggestion for a canvas sheet-deck for life-boats.

[n] Termed by the inventor "Momentary-motion Life-boat:" a "resuming lever" to right the boat if upset; area of delivering-valves 38 square inches.

[o] A revolving spindle-shaped air-case in the bottom. A transporting carriage.

[p] A rolling cylinder at bottom.

[q] Suggestion for metal spring-valves for freeing a boat more rapidly of water.

[r] Air-cases fore and aft on flat; hollow keel for water; 14 valves for discharging water.

[s] Sliding keel; air-cases 12 inches deep under the flat.

[t] Fitted with seven gutta percha tubes fore and aft, rising 6 feet above the gunwale amidships.

[u] Open bottom, and two keels.

[v] Grating deck; open bottom.

Catalogue of Life-Boat Models and Plans submitted to compete for the Northumberland Premium—*continued.*

NAME OF BUILDER, &c.	Address.	Length.		Breadth.	Depth.	Sheer of Gunwale.	Weight of Boat and Gear.	Number of Oars.	Cost.
		Extreme	Of Keel.						
		Feet.	Feet.	Feet.	Feet.	In.	Cwt.		£.
Thompson, Mark[a]	Bishopswearmouth	36	26	11¼	5¾	28	47	14	140
Thompson, John[b]	Rotherhithe	32	—	10	3½	—	—	—	—
Thompson, Wm.	Norwich	48	44	13½	5½	—	..	12	..
Thorpe, F. C. (*Raft*)†[c]	9, Upper Belgrave-street	20	—	8	1¾	—	—	—	65
Tredwen, R. & J., 2 models[d]	Padstow, Cornwall	32	26	6	3½	3	12½	6	60
Treseder, S..	Cardiff	28½	20	11½	3½	13	15½	10	110
Tripier, Hugue François[e]	Rue d'Amsterdam, 45, à Paris	..	..	..	..	..	..	..	..
Turner, George[f]	H.M. Dockyard, Devonport	36	33	5¾	1½	27	18	7	45
Vigers, E.†[g]	Upper Lisson-street, Paddington	40	27	9	3½	24	20	12	155
Wake, T. and Son[h]	Sunderland	34	17½	15¾	3½	20	45	12	140
Wake, R. F.	Sunderland	31½	23	7½	4	11	..	—	—
Wake, W. M.	Sunderland	36½	20	9	4	15	40	12	—
Walker, Thos., (*Raft*)	Coleshill-street, Pimlico	30	—	10	5	—	—	12	15
Walker, Robt.†	Norwich	36	—	10	5	72	—	8	100
Walsh, J.[i]	Ringaskiddy, Cork	24½	20½	6½	2¾	8	20	4	70
Walter, G., Lieut. *R.M.*[j]	Greenwich	34	24	12	4	20	—	12	—
Warren, Richard	4, Nelson-place, City-road	25	17	8⅜	3	9	40	10	350
*Waterman, T. (*Plan*)	Admiralty, Somerset House	30	26	8¾	3¼	10	19	10	80
Watson, T.[k]	20, Bird-street, North Shields	26	18	9½	3½	24	48	20	50
Watson, John[l]	Leith, Scotland	45	41½	12½	4¾	18	160	10	—
Webb, J. G., 3 models[m]	92, St. John's-street, Smithfield	—	—	—	4	—	25	—	100
Wentzell, A.	Lambeth	25	20	7½	3	8	21	8	80
Whettem, James[n]	Portsea, Hampshire	26	—	7¼	2¾	19	28	12	70
*White, T. and J., 5 models.	Cowes, Isle of Wight	32	27	8	3	18	30	6	75
Westaway, R.[o]	9, Lockyer-street, Plymouth	30	—	8½	6	12	—	10	—
Wilkinson, G., 2 models*[p]	Newcastle-upon-Tyne	38	—	12½	4	24	58	14	180
Williams, W.[q]	Greenwich	36	—	8	2½	12	—	18	210
Williams, W. (*Plan*)[r]	Bishopswearmouth	..	..	..	..	..	..	..	..
Wishart, T., 2 models	Fish House, Kircudbright	20½	19	5½	3½	12	25	12	55
Woodall, J., 2 models	Scarborough	30	18	10½	4	24	40	12	40
Young, Arthur[s]	Dundee	..	..	..	..	..	..	..	..

* Of iron. † Of gutta percha.

The * before name implies that the model is described in detail.

[a] Air-case under flat 3 feet deep; a closed well for 3 tons of water-ballast; scuppers in side, and discharging-tubes through the bottom.

[b] Diagonally built, of mahogany. Air-case 12 inches deep under flat; air-cases at sides and at one end; lined with copper. Extra buoyancy 200 cubic feet, equal to 6 tons. No ballast. Internal capacity 80 cubic feet; area of discharge 196 square inches, or as 1 to ·4. Cork sheathing on bottom.

[c] Propelled by paddles.

[d] Model. No. 2, is a galley-shaped boat. Air-case 15 inches deep under flat; midship air-case up to thwarts 2 feet wide, and in ends up to gunwale; small sheer; 2 cwt. of iron ballast; internal capacity 3 tons, or 105 cubic feet; area of discharge 30 square inches, which is to capacity as 1 to 3·5.

[e] An ordinary boat fitted with copper air-cases under the flat and bilge, with lead-ballast to lower when requisite, and self-acting valves to deliver any water shipped.

[f] Safety galley for the Coast Guard service.

[g] Longitudinal and vertical gutta-percha tubes filled with cork cuttings; the same under the flat 18 inches deep; air-cases in extremes up to gunwale; four syphon tubes to discharge water; and a tube raft at each end.

[h] A powerful boat, and would pull well. Air-case under the flat 12 in. deep, and along the sides; extra buoyancy 650 cubic feet, equal to 18 tons; closed tank for water-ballast ¾ ton; internal capacity 4½ tons, or 160 cubic feet; area of discharge 90 square inches, which is to capacity as 1 to 1·8. Built the life-boat at Whitburn.

[i] Fair lines, rising floor, upright stem and stern-post.

[j] Kamptulicon life-boat.

[k] Self-acting scuppers.

[l] A common boat, large water-tank, and two iron keels.

[m] Propelled by 10 men pumping water.

[n] Air-cases round the sides, from top of thwarts up to gunwale, and in extremes; also under the thwarts 3 inches deep; rake of stem and stern-post 11 inches in a foot. A good boat.

[o] Inventor of an anchor.

[p] Air-case under flat and round the sides; 16 tubes for discharging water.

[q] A triple bottomed boat.

[r] To illustrate the principle of righting.

[s] Brisbane's apparatus of cork shavings in canvas tubes.

REPORT on the LIFE-BOAT ESTABLISHMENT of the LIVERPOOL DOCK TRUSTEES.

October 16*th*, 1843.

IN compliance with the instructions of the Sub-Committee on Shipwrecks, that I should report on the Life-boat Establishment at this Port, and the extent and nature of the banks in Liverpool Bay, I have to submit the accompanying statement:—

There are nine Life-boats, stationed as follows,—

Liverpool . .	2	boats,	1	master,	and	10	men.
Magazines . .	2	„	1	„	„	10	„
Hoylake . .	2	„	1	„	„	12	„
Point of Air .	2	„	1	„	„	10	„
Formby . .	1	„	1	„	„	12	„

Nearly all the boats have been built since 1839; they pull double banked, are rigged with two spritsails and a jib, are of large size, possess great strength, and are constructed on the most approved principles, with air-tight casks inside, and a broad band of cork running round the whole length of the boat above the water-line, to resist violent shocks and give increased buoyancy, enabling the boat to float although loaded with a considerable number of persons and filled with water; as many as 50 individuals having on one occasion been rescued from a wreck at one trip, making, with the boat's crew of 11, 61 persons in the boat at one time.

The boats are kept on carriages in boat-houses near the shore, and horses are provided to enable them to proceed to the most advantageous spot for launching; a gun is placed at the station to summon the crew, as also distress-flags at each lighthouse, lightship, and telegraph station, for the same purpose; the arrangements in these respects being such that, in many instances, the life-boat has been manned, launched, and on her way to the wreck in 17 or 18 minutes from the time of the distress-signal being seen.

The masters and crews of the Hoylake, Magazines, and Formby boats are composed of picked fishermen intimately acquainted with the banks, swashways, tides, and currents in Liverpool Bay: they reside in the immediate vicinity of their respective boat-houses.

The Liverpool boat's crew consists of experienced boatmen residing in the town.

The Point of Air boat's crew consists of two experienced Hoylake fishermen as master and mate of the boat (these men have been engaged for the last four years at an increased annual salary, expressly for the purpose of organizing this boat's crew); and the rest of the crew are selected from the best and most expert men that can be found in the neighbourhood.

The whole of the crews are kept in constant and permanent pay; they are regularly mustered and exercised once a-month, and no expense has been spared in rendering the boats, their equipments, and crews, as perfect as possible.

The Hoylake boat is under the active and vigilant superintendence of Mr. Sherwood, Revenue Surveyor, at Hoylake: the Point of Air boat under that of Mr. Dawson, of Gronant; and the Formby boat under the direction of the keeper of Crosby Lighthouse.

The banks and dangers in Liverpool Bay may all be comprised within a triangle, formed by the western patch of West Hoyle, the Rock Lighthouse, and Mad Wharf; the former (West Hoyle) distant from Liverpool 19 nautical miles; the latter (Mad Wharf) 12 nautical miles; the cross distance between West Hoyle and Mad Wharf being 16 miles. The principal banks are West Hoyle, East Hoyle, Great and Little Burbo, the Jordan Flats, Burbo Flats, Mad Wharf, Mockbeggar Wharf, Formby Bank, and Taylor's Bank.

They are all remote from Liverpool, and many of them several miles distant from the nearest life-boat station. Many patches of all the banks dry, and some of them to a considerable height above the low-water level; but in heavy on-shore gales of wind, owing to the shelving nature of the sand-banks and the shallowness of the water, a continuous line of heavy breakers extend far to seaward on the weather side of them, rendering it extremely difficult, and at times perfectly impracticable (however advantageously the boats may be placed, and however near they may attain the position) to penetrate to a wreck so situated, without the certain and inevitable destruction of the life-boat and her crew. This has been strongly exemplified in the case of the *Athabasca* and the *Dispatch* lost on West Hoyle: in both instances the life-boats reached the scene of the disaster, although four miles distant from Point of Air and ten from Hoylake stations, but were obliged to abandon the crews to their fate, after repeated attempts to penetrate the line of breakers extending outside of them. Numerous instances of a similar nature might be adduced, occurring to vessels lost on the sand-banks on the east coast of England; one in particular recurs forcibly to my memory, that of the *Ogle Castle* Indiaman, lost on the Goodwin Sands:—in this case the Deal boats were so near as distinctly to see the successive surges sweep away the unfortunate crew from her deck and rigging, without being able to render the slightest assistance.

The remoteness of the banks from the land, and the long line of shoal water extending from them, renders the use of all projectiles, such as mortars, rockets, &c., inapplicable in Liverpool Bay, as it very seldom happens that a wreck can be approached sufficiently near to render them available.

In face, however, of all the natural difficulties which Liverpool Bay presents, under these circumstances, and with the immense amount of shipping which enters and quits the port, it must be a gratifying fact for the Committee to know that for the last four-and-a-half years only one case (that of the "Despatch" sloop, lost on West Hoyle) has occurred in which the life-boats could not render assistance, owing to the circumstances above shown; whilst in the same period no less than 74 vessels have been assisted, and 415 lives preserved, by their Life-boat Establishment, owing, no doubt, chiefly to the judicious position of the life-boat stations, by which

one or other of the boats has always been able to reach the scene of the wreck; and lastly, to the perfect confidence the crews feel in their boats, and the praiseworthy exertions they have invariably shown in the performance of their duties.

To facilitate the operations of the life-boats, an arrangement is in existence with the Steam Tug Company, by which one of their steamers is to proceed out immediately the signal of distress is seen flying, taking in tow the first life-boat that reaches her, whether their own or one belonging to the Dock Trust, or both if the weather will permit of it.

In order to point out and identify the exact spot to which the steamer or life-boats are to proceed, the whole of Liverpool Bay and the coast from thence to Holyhead has been divided into squares, numbered consecutively on the Chart, each lighthouse, telegraph station, &c, being provided with a copy of such chart, and the keeper directed to report by signal the number of the square in which any wreck may occur.

To the Chairman of the Sub-Committee on Shipwrecks. (Signed) WILLIAM LORD.

LIVERPOOL LIFE-BOAT ESTABLISHMENT.—RETURN of SERVICES rendered during the Years from 1840 to 1850, both inclusive.

	1840		1841		1842		1843		1844		1845	
	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.
Liverpool	9	..	6	..	3	..	12	..	6	180	13	..
Magazines	7	20	4	..	6	5	9	5	12	7	13	..
Hoylake	4	1	5	143	3	..	6	3	3	..	7	37
Point of Ayr	7	7	3	140	3	4	5	2	6	20	10	113
Formby	4	29	2	..	3	..	5	..	13	..	13	7
Total	31	57	14	283	10	9	24	10	27	207	36	157

	1846		1847		1848		1849		1850		Totals.	
	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.	Vessels Assisted.	Lives Saved.
Liverpool	15	..	12	2	3	..	9	33	8	28	96	243
Magazines	15	214	15	6	3	..	13	..	9	33	106	290
Hoylake	12	6	2	..	4	4	8	..	5	7	59	201
Point of Ayr	8	15	2	..	5	10	7	5	4	16	60	332
Formby	8	20	6	..	4	3	7	..	5	3	70	62
Total	38	255	21	8	12	17	25	38	31	87	269	1,128

Total number of vessels assisted during the above period . . . 269
,, lives saved ,, . . . 1,128

The total number of vessels assisted appears less than that given by the figures in the above columns, but this arises from two, and in some instances, three, boats having assisted the same vessel. This observation does not apply to the number of lives saved, which will be found to agree with the figures in the columns.

Marine Surveyor's Office, January 1851. WM. LORD, *Marine Surveyor.*

EXTRACTS from LETTERS of Mr. ROBERT ANDERSON, Treasurer of the LIFE-BOAT FUND of the Ports of NEWCASTLE-UPON-TYNE and SOUTH SHIELDS.

South Shields, February 4, 1851.

DIMENSIONS and description of the South Shields Life-boat to which the accident happened on the 4th of December, 1849:—

	Ft.	In.
Extreme length . .	34	0
,, breadth . .	10	10
,, depth . . .	3	4
Sheer of gunwale . .	2	6
Curve of keel . . .	0	11

	£.	*s.*	*d.*
Cost complete, with all fittings and stores .	234	4	4
Carriage	60	0	0
	£294	4	4

She is built both ends alike, to row either way, and thoroughly copper fastened. She has a belt of cork round her outside, below the gunwales, about 18 inches broad, and 3½ inches thick in the middle, acting as a fender and giving side buoyancy; fitted with air-boxes at the ends, in the bottom, and sides, up to the thwarts, having the same sheer as the gunwale; and with a well in the centre of her bottom 12 inches deep and 6 feet square, holding nearly a ton of water, as ballast, which can be filled by opening two valves when the boat is afloat; and they drop and close themselves when the well is full: the water can be pumped out, if desirable. She has open tubes through her bottom, that (in case of her being filled) will empty her, with 29 men in her, in four minutes, leaving about two or three inches of water upon her sheets. She had an open well when the accident happened, and when the boat was thrown over end, the water would, of course, run out over her stern: since that time the well has been enclosed, and reduced in size, as above described, and I consider her now as safe a boat as any of the others; and we have two others in the establishment at this port, both of which, at present, have open wells in the middle; but if the trustees, at their next meeting, sanction the improvement, I intend to propose that they shall all be made alike.

It must be borne in mind, that the life-boats at this port had been in constant use upwards of 60 years, without any accident, or failing to bring all on shore that they went for, and the greatest confidence was placed in them; nor has that confidence in the boats been lessened by the melancholy accident that happened on the 4th December, 1849, as the evidence given at the inquest by the superintendent who was saved, went to prove that it was not the fault of the boat; at the same time it is most desirable to do everything that can be done to improve the boats: and since the accident, the trustees have paid (in conjunction with the trustees of Sunderland) 71*l.*, in premiums, for the best models and improvements, when all that was elicited was, the plan of ballasting the boats with water, which was not new (as I fitted the Warkworth life-boat on that plan here with a closed well, in 1844); but it was considered the greatest improvement in 1850, and the first prize of 30*l.* was awarded to that model. A new boat has been built at Sunderland on that plan, since the Exhibition, and I have no doubt she will answer very well.

ROBT. ANDERSON, *Treasurer of the Life-boat Fund.*

It may not be generally known, that the life-boats of the port of Newcastle, stationed at the entrance of the Tyne, in North and South Shields, (the latter being the place where the boat was invented in 1789,) have, for about 60 years, been instrumental in saving the crews of those vessels which were unfortunately stranded at the entrance of the port; and although no correct account was kept of the exact number so rescued from danger previous to the year 1841, the Committee have it in their power to state, that since that period 466 persons have been brought safe on shore from 62 stranded vessels; and if that number has been saved in nine years, the public may form some estimate of the number brought on shore during the long period of 60 years, during which these boats and men have been actively employed in the service of preserving life from shipwreck; and it has always been a source of deep gratitude to Divine Providence, that up to the present calamity, no accident, with loss of life, has occurred in these boats.

On the morning of the fatal accident, the *Betsy*, of Littlehampton, laden with salt, was stranded at the Herd Sand; and the receding tide left her among heavy breakers, with a heavy ebb-tide running past her, as she lay with her stern towards the land, and her bows towards the sea, to the eastward. Notwithstanding the difficulties that presented themselves, from the adverse state of the tide, running against the heavy sea, the life-boat was launched about 9 o'clock, A.M., and being manned with 24 pilots, immediately proceeded to the vessel, and having hailed her and given instructions to the persons on board to have two good ropes

ready for them, they waited between the ship and the shore a little time, until the ropes could be got ready, when they again proceeded to the vessel, and succeeded in getting alongside. The rope from the after-end of the vessel was received into the boat, but (owing to some difficulty in the way, upon the sand to the south of the vessel, and within 20 yards of her) she had to swing round with the other end to the sea, and the rope from the fore-end of the vessel had just been received, reeved in the ring at the stem, and a few fathoms hauled into the boat, to bear and haul upon, and the shipwrecked men were preparing to descend into the boat, when a terrific knot of a sea, recoiling from the resistance it met with from the vessel's bow, threw that end of the boat up, over-end; and the bow-rope not holding, from some unfortunate cause, was driven in that position (with the unfortunate crew all thrown into her stern, with all the water that was in her,) astern of the vessel into the rapid ebb-tide; which running into her after-end, caused in a moment the catastrophe, which could only have been prevented by the holding fast of the rope from the bow of the vessel; and thus 20 brave men, who had gone out in full confidence to perform an act of humanity, such as they were in the constant practice of performing night and day, whenever it was necessary, met that fate from which they had gone to rescue the crew of the stranded vessel. The accident was seen from the shore, and immediately the second life-boat was launched from South Shields, and with 17 of the pilots, proceeded, with all the expedition that was possible, to the assistance of the boat's crew. They found and rescued three. One had succeeded in getting on board the brig; and these were the only four that were saved. Nor were the crew of the stranded vessel forgotten. The third life-boat from North Shields was launched as quickly as possible; and notwithstanding the appalling accident, a crew of 17 brave fellows manned her instantly, and proceeded alongside of the *Betsy*, and brought all her crew, and the pilot who had been saved, on shore without accident. Thus, amidst all the distress arising from the loss of many of their relatives, the duty was performed, and the lives of the shipwrecked crew were saved.

By order of the Committee,

ROBERT ANDERSON, } *Secretaries.*
THOMAS SALMON, }
SOLOMON SUTHERLAND, *Assistant Secretary.*

South Shields, December 14, 1849.

South Shields, April 21, 1851.

IN answer to the queries of the Northumberland Life-boat Committee, I have to state that,—

The original, or Greathead's life-boat, was built in South Shields, in the latter part of 1789, by subscription, and went off for the first time on the 30th January, 1790, and brought on shore the crew of a vessel stranded on the Herd Sand. She was very nearly of the same shape as our present boats, but was only 28 feet long, 9 feet 4 inches broad, and 3 feet 1 or 2 inches deep, amidships. She had no air-cases; had only a belt of cork outside, which did not go to the ends, and she was packed with cork inside on and along each side, under the thwarts; this was all the extra buoyancy she had, and when filled with water, had to return frequently to bale it out with buckets. The old Northumberland boat, built at the expense of the Duke of Northumberland a year or two afterwards, was as similar to South Shields boat as she could be built, and of the same size. These two were the only life-boats at this port for many years, and did good service, of which a very imperfect record was kept.

About 30 years ago the old South Shields boat struck upon the rocks when going to a stranded ship, and the men with difficulty got on shore; the boat was destroyed, the Northumberland boat being the only life-boat left, and is still kept at South Shields, though not used as a life-boat.

An attempt was made to build a new boat by subscription for South Shields; but a gentleman, a native of the town, then resident in London (Mr. Thomas Forrest)—now, I am happy to say, still living in South Shields—hearing of the loss of the boat, ordered a new boat to be built, 30 feet long, at his sole expense, and she is now the smallest of the three boats we have in use. She was rebuilt four or five years ago, and is a very fine handsome boat.

I may now say that, with the sole exception of the lamentable accident on the 4th December, 1849, as related above, no accident ever happened to these boats in a service of upwards of 60 years, nor has any person belonging to a stranded ship been drowned at the entrance of this port for want of a life-boat. I believe two men were drowned under Tynemouth Castle, from a vessel called the *Percy*, three or four years ago, in attempting to land by a rope thrown over her by a rocket. As soon as it was known, the life-boat was manned, dashed over the bar, and went round and took off four men that were left, and brought them safely into the harbour.

The height of the bottom well and air-cases from the inside of the bottom plank to the under side of the covering or deck, is 15 inches clear space, and this deck rises towards each end. As far as I can ascertain, the cubical contents by measurement between the deck and the bottom of the boat, the space contains 224 cubic feet of air and 30 cubic feet of water-well.

The water being in the centre of the boat to act as ballast, the well fills itself as soon as the boat is in the water and manned, through two tubes which can be opened and shut at pleasure.

This well (which has been closed and improved since the accident), when filled, gives greater stability to the boat. A few days ago we tried her stiffness, when 33 men stood upon one gunwale, and it was then 3 inches free of the water.

These boats have air-cases along the sides (above the bottom-deck) under the thwarts, with flap tops, which I think objectionable, and would prefer them in a diagonal form, narrowed at the upper part; but our pilots prefer having them in their present shape, and we must consult their wishes in some respects, as they have the work to do and the risk to run.

In the last 11 years, since I have kept an account, our boats have been off 84 times, one or other of them, and the number of persons saved, 493.

The manner of approaching a wreck depends upon so many circumstances that one cannot give any general answer: they never go to windward of a wreck, and drop an anchor and veer down to her; they carry grappling-irons, with the finest white ropes attached to them, to hook on to channels or shrouds, or any place they can get hold of, when the crew (as it often happens) cannot throw them a rope; and they approach mostly to leeward, and rarely go alongside, generally receiving the men into the end of the boat, which renders it necessary to keep the end as clear and roomy as possible.

Since our boats were fitted so as to free themselves of water, they have never been obliged to put back; they sometimes wait a little for a favourable opportunity to get the men out.

We have no accident, except 4th December, 1849, and when the old boat was wrecked as before described. No life was lost. Our boats never use sails.

It is of great importance that a life-boat should be so constructed that she may be turned quickly round to face the sea. The curved keel is very useful in this case, and I think that a little more curve of the keel than ours have would be advisable; only if you give them too much, it impedes their rowing. Our boats have 10 or 11 inches curve of keel. Our boats are built in thirds, that is, the breadth is one-third of the length, and the depth one-third of the breadth. Now, I am inclined to make them a little broader, viz.:—length, $32\frac{3}{4}$ feet; breadth, $12\frac{1}{3}$ feet; depth, 4 feet. I think a boat of these proportions, with a water-well in her bottom, will never upset, with careful management; certainly not in broken water, which they generally have to contend with.

I have sent a little boat, $16\frac{1}{2}$ feet long, up to the Exhibition: she is calculated for either beach or ship service: she won't upset. I have tried her well on the Herd Sand in a heavy sea, end on and broadside on. She has a concealed tank, by which she ballasts herself with 435 lbs. of water; or she will carry that quantity—about 43 gallons of fresh water, in case of leaving a ship at sea. She has also air-tight cases, to carry dry provisions, and is fitted with short-masts and storm-sails. When filled with water, and five men in her, she empties herself in two minutes, with the well full. She sails and turns to windward well when it blows hard, and will never upset. She has an air-tight ceiling, upon which all the inner compartments are fitted: perhaps you will look at her. I intend her to be a great improvement on the present life-boats carried by emigrant ships and steamers, and shall register her under the new Act of Parliament. These boats will not be expensive, nor heavy, and will be perfectly safe. Two 24-feet boats, so built and fitted, would save a great number of people. With water and provisions, and as shore life-boats, I consider them as safe as any that can be built; but I don't wish to interfere in any way with the exhibitors for the Duke's munificent premium.

ROBERT ANDERSON.

COPY of a LETTER addressed to the COMPTROLLER-GENERAL of the Coast Guard, by Commander JERNINGHAM, on the subject of Experiments on Mortars, Lines, &c., ordered to be tried at Woolwich by the COMMISSIONERS of CUSTOMS.

SIR, *North Yarmouth, June* 1846.

IN reference to my letter of the 4th February last, suggesting experiments with Manby's mortar, I have the honour to lay before you the result of those experiments, which were conducted by me in the Woolwich Marshes, with a view of ascertaining the greatest range that can be obtained with a shot attached to a line.

With this view I took the mean of several days' practice, the wind blowing fresh against, across, and with the range, with various charges of powder at different elevations, and with two kinds of lines, namely, of Russian and Manilla hemp, of equal size, but varying in weight.

As with all projectiles, the wind has great effect upon these shot; but, of course, the more so as having a line attached to it. A strong wind directly against the range requires a less elevation than in moderate weather, as a less surface of the line must be offered to the wind, for this reason, from 28° to 33° will be found to attain the greatest ranges in blowing weather, and in moderate and calm weather 37°.

The wind across the range will reduce the flight more than when the wind is directly against it, and if two mortars are fired simultaneously, under similar circumstances as to charge of powder, one across and the other against the wind, the range will be least when the wind is across the range.

The force of the wind varying much in heavy weather, renders it difficult, and, indeed, next to impossible, to lay down any rule for the best elevation; but I am of opinion that from 28° to 33° should be the limits. The variations of the ranges have proved so capricious, that I have occasionally obtained the same results with 25° as with 33°. It must, however, be evident from the laws of projectiles, that the more horizontally the line can be fired, the less will be the resistance of the air upon it, and that no more elevation should be given than is necessary to obtain the required range.

Comparing the ranges obtained by me with those of Captain Pulling, R.N.,* I find myself borne out in my opinion of the requisite elevation.

The quality and charge of powder is a matter of the utmost importance, affecting the ranges very materially; and some addition will be requisite to the charge where powder has become deteriorated by long keeping in a damp watch-house or store-room.

The principal advantage that has resulted from these experiments has been the increase of range obtained by using a heavier charge of powder, and lines of Manilla hemp.

With reference to the charge of powder, no more than 16 oz. ought to be used with the brass 5½-inch mortar, and when the charge exceeds 12 oz., the large cylindrical shot should be fired. Here the density compensates for the variations in the increased resistance of the air, and the initial velocity not being so great as with lighter shot, there is less likelihood of breaking the line.

Lines of Manilla hemp will stand the force of 16 oz. of powder, even with the lighter shot, when 12 oz. will frequently break the lines of Russian hemp.

The size of the lines used in the experiments consisted of three strands of two yarns each of Manilla hemp laid up soft. By stretching the lines well before use, it was found that the wet had not the effect of shrinking them up into kinks as might have been expected from their elasticity, and they will bear being fired when wet without breaking, which is not always the case with lines of Russian hemp. They are also much lighter, 120 fathoms of Manilla inch-line weighing 16 lbs., when the same of Russian will weigh 30 lbs.; they, consequently, float on the water.†

I found when the lines were balled up, as is practised by rope-makers in balling spun-yarn, they were more portable than on racks, as in present use, were less liable to be fouled, and would always run out clear when taken from the heart of the ball.

Manilla hemp has also the advantage of bearing the discharge of the powder, and may be made fast directly to the shot without the intervention of hide, the latter frequently breaking when the strops have been a long time in store. One shot was fired 27 rounds with the same Manilla strop without any apparent damage. By adopting this plan, the expense and uncertainty of the hide will be obviated.

Manilla has the advantage over Russian hemp in every point for the purposes required in the life-apparatus. It is cheaper, stronger, lighter, more durable, more flexible, more elastic, is buoyant, and takes up less space.

In support of its strength in standing a jerk, it resisted a charge of 16 oz., when 12 oz. broke the Russian hemp lines; also, from a test made by a steady strain with a weighing-machine, when a ¾-inch Manilla line of 6 threads broke at 4½ cwt., and a Russian hemp line of 1¼ inch, 18 threads broke at 7½, giving 84 lbs. to each Manilla yarn, and 45 lbs. to the Russian.

---

* See Parliamentary Reports of Select Committee on Shipwrecks for 1843, Appendix 14 [549.]

† Messrs. Tull, ropemakers of Fenchurch-street, give the comparative weight of St. Petersburg and Manilla ¾ inch-line, or 31 to 22; that is, 120 fathoms of Russian ¾ inch-line weighed 15½ lbs., and of Manilla 11 lbs.

Experience also has proved that Manilla line will bear being coiled away when wet with salt water, and that it will bear longer wear and tear. I should, therefore, strongly recommend that all rope attached to the life-apparatus should be of Manilla hemp, especially the stay, which when of Russian hemp, sinks to the bottom, and when used on a flat beach, takes the rescued party under water while being hauled ashore. Its elasticity and floating properties are in its favour when the wreck is rolling, and its lightness will considerably reduce the weight of the contents of the transporting cart; an important desideratum in all cases, but especially on a loose sandy coast.

By supplying each mortar-station with two 1½-inch lines of 120 fathoms each, they might be rendered available either as whips when required, or as warps when attached to the anchors for hauling a life-float off a beach.

I deem it unnecessary to swell this Report with all the various ranges obtained under a variety of weather, both at Yarmouth and at Woolwich, there being no scale by which the force of the wind could satisfactorily be obtained; but by giving the mean of extreme ranges obtained in fine, and moderate and heavy weather, with their respective charges and elevations, I consider that all that may be required will be obtained.

Ranges obtained with Shot 30 *lbs. weight, attached to lines of equal size of Russian and Manilla Hemp, with a Brass* 5½*-inch Mortar at an elevation of* 33°. *Charge* 10 *oz. of powder. Mean of* 20 *rounds.*

Fine weather and light winds . . .	Russian . .	245 yards	
„ „	Manilla . .	285	„
Moderate weather, fresh breeze . . .	Russian . .	237	„
„ „	Manilla . .	279	„
Elevation 28°. Strong gale and heavy squalls .	Russian . .	211	„
„ „ .	Manilla . .	243	„

Less charges with similar elevations will give less ranges; but not less than 6 oz. of powder should be used, which, in moderate weather, will give a range exceeding 200 yards.

Should a very long range be required, two lines of Manilla hemp should be balled in 120 fathoms each, and the first six or eight fathoms pulled out of each ball. They should be bent to each other, and the shot should be of lead if spherical, with a short shank, attached with a becket of 1½-inch Manilla, and then bent to it with a long running eye, so as to allow it to render in its flight, thereby saving the sudden jerk. The large cylindrical shot will be found to give an extensive range by adopting the same measures. These may safely be fired with 16 oz. of powder, and the range will be found to equal 350 yards in moderate weather with 37° elevation, and 280 yards in strong winds with 28°.

In case where the wreck is close, two lines can be fired attached to a cylindrical shot with 16 oz. of powder. The communication being effected by cutting the lines on board, they may be rove (knotted or spliced) through a block, establishing a whip at once.

When the lines are wet after firing, to save time they may be safely fired directly off the beach as they lay, keeping all the parts as much as possibly upon one another like fishermen's lines. I have fired many lines in this manner with 16 oz. of powder with complete success; but when the time will allow of it, the line may be reeled into balls by a simple winch about 3½ inches diameter, tapering to 3 inches, fitted on the handles of the hand-barrow. By this they may be reeled into very compact balls, and kept in bags of painted canvas or wicker-baskets. One line may be in a tub with the head to take off, which being filled previous to firing with oil and phosphorus, will illuminate the line in a dark night.

In reference to the deflection of the line, as mentioned in my letter of the 4th of February, I may state that many more experiments would be requisite to establish a law for that purpose, and that much time would be required, and great attention necessary to obtain it under all the influences of the wind: I hope, however, during the ensuing winter to carry out this inquiry, with the aid of Biram's Anemometer, by which the velocity of the wind may be estimated with sufficient accuracy.

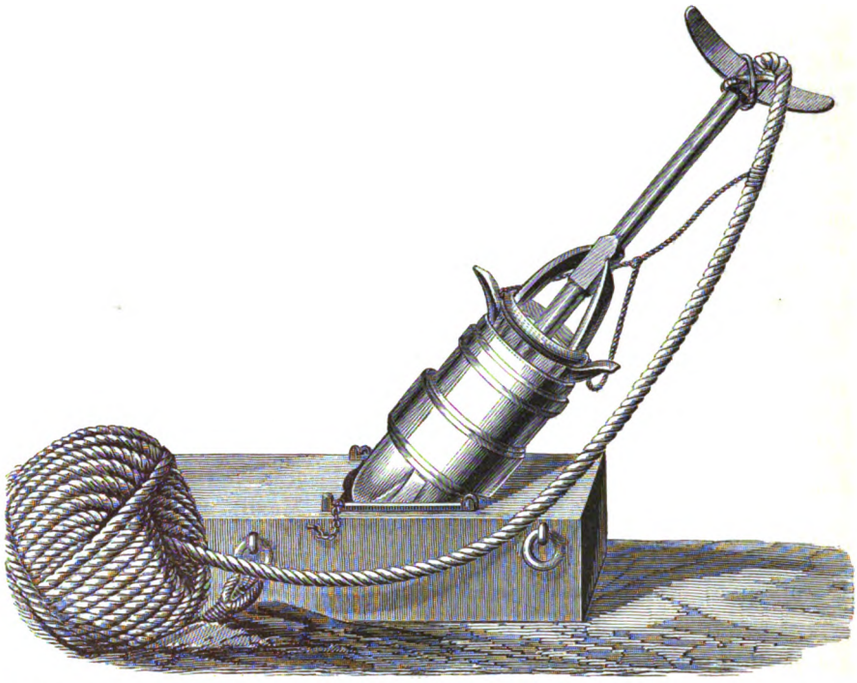
In reference to my third proposition in the above letter, of effecting a communication with the wreck from a boat, I am happy to be able to state, that experiments with hand-rockets to carry a line are in course of progress by Lieut. Colquhoun, of the Royal Artillery, who has undertaken to endeavour to effect this desirable object in the course of this summer.

I have, however, now in my possession a small hand-mortar fitted with a shoulder-stock, to carry a leaden projectile attached to a line which gives a range of 80 yards. It is the suggestion of Miss Gurney, a well-known humane and charitable lady, residing at Northrepps, near Cromer, who keeps a life-apparatus on her property entirely at her own expense. It is so simple and handy that it ought to be in general use in all life-boats.

In connexion with the subject of saving life from shipwreck, I have the honour to enclose a rough sketch of an anchor-shot, which after very many anxious experiments I can recommend as capable of standing the discharge of 10 oz. of powder from a brass 5½-inch mortar, taking out a rope of 1½-inch, 210 yards, in moderate weather, with an elevation of 33°, and 150 yards in a gale of wind. Its holding power on a sandy bottom is equal to the strength of 12 men; and I have no doubt but two such anchors would haul off any life-boat through a surf on the eastern coast, if required.

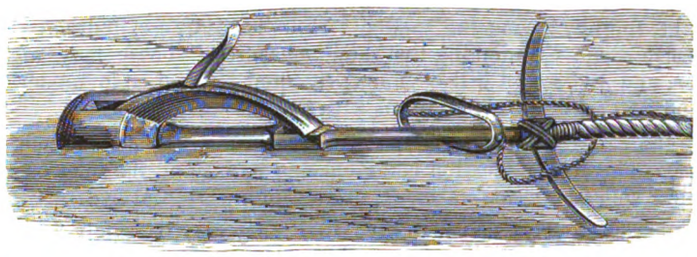
The following wood-cut represents the anchor as placed in the mortar ready for firing (Fig. 1):—Length of shank 30 inches, of stock 26 inches, of flues 30 inches each; weighs 45 lbs.; cost, £ .

Fig. 1.



The subjoined cut represents the anchor after it has taken hold or bit the ground (Fig. 2).

Fig. 2.



In the manufacture of these anchors, great care is requisite that the very best iron should be used; and if made by contract, a certain proof should be required. The iron of which those sent from Woolwich was made was capable of having an overhand knot tied in a bar when cold, and cost the Government 24*l.* per ton.

The principal difficulty I had to contend against was the breaking of the stock from the force of discharge; but by giving a good shoulder to the end of the shank where the stock fits, I overcame this difficulty.

I have now an anchor-stock which was made at Woolwich, in the Arsenal, which has been fired 17 times, and is still fit for use. I tried several forms of stock, but I found the straight stocks, when made of good iron, answer so well that I did not think it necessary to have more than one form of stock; I also tried ash, which stood remarkably well, but as it held the wind much more than iron, I gave it up.

I respectfully beg to call your attention to the accompanying Copy of Instructions for the use of Life-apparatus, which are founded on many inquiries and considerable experience.

I have the honour to be, &c.,

ARTHUR W. JERNINGHAM,
Inspecting-Commander,
North Yarmouth.

To the Comptroller-General,
Coast Guard.

INSTRUCTIONS for the USE of MANBY'S MORTAR and LIFE-APPARATUS.

The cart for transporting the mortar should contain 120 fathoms of 3-inch Manilla rope, which should be coiled flat in the bottom of the cart; also a whip rove through a 5-inch-block, fitted with a tail; the whip should be 1½ inches, consisting of two coils of 120 fathoms each, spliced together. These may also be used as warps, if required, with anchor-shots, to be fired from the mortar for hauling off a boat in case of wreck.

Four mortar-lines made up in balls, similar to the way twine is balled; one of these balls should be contained in a tub, with the head so fitted that it can be taken out; the head to be in one piece, with a plug-hole in the centre, and the plug made fast with a lanyard: the remaining three balls should be contained each in a painted canvas-bag fitting tight round them, or in wicker-baskets.

Four round barbed shot fitted with fuzees, weighing 30 lbs. each; two cylindrical barbed shot, and two large oval long barbed shot, should be suspended under the axle, and three anchor-shot contained in the cart; also, a luff-tackle, with large hooks. The mortar-bed and coin, with ammunition-box, should be placed in the fore part of the cart.

The ammunition-box should contain 8 cartridges of 10 oz., 16 of 8 oz., and 8 of 4 oz.; one portfire and spare slow-match, a pistol and tube-box containing spare fitted flints or percussion-caps, should be kept separate from the ammunition. The ammunition might be contained in a copper tube, with leather mouth, the size of the bore, and should be placed inside the mortar; the muzzle of the mortar to be covered with a painted canvas cap, which should be used in wet weather to keep the powder dry, and a sheet-lead apron fitted with a lanyard over the vent for the same purpose. Waterproof cartridges are very desirable as the muzzle of the mortar is necessarily exposed to wet from its elevation. They may be made of sheet-lead, bladder, &c.

The cart should likewise contain a hammer, attached to the cart with a lanyard, a shovel, lint-stock, portfire-stick, and 50 fathoms of 1-inch line to be used as stray-line, to be bent on the outside end of each ball; this line should be marked in 5-fathom lengths, two short stakes, about two feet in length, to be driven into the ground five fathoms apart, are also required for the purpose of stopping up the lines in 5-fathom length; also spunyarn and a piece of sheep-skin, for wiping the shot before it is placed in the mortar. The beckets on the shot should be grummets of 1½ inch of Manilla rope, 1 foot long in the bight, and should be marled with Manilla yarn; a small box should be attached to the side of the cart containing a marline-spike, a hammer, and other small articles. Small tallies should be attached to the outside of the cart, near this box, with the following words painted upon them:—

Make this tail-block fast.
Make fast this rope, and cast off the whip.

These tallies should be painted in legible characters, in the respective languages of the various nations frequenting the parts of the coasts where the apparatus may be placed, and the name of the nation they belong to; a drag-rope of 2 inches, 5 fathoms length, fitted with hooks and thimble, should be attached to the cart to the shaft under the front board, and made up into a small-hand coil. Lanterns with candle should be fitted as lamps on each side of the cart, ready for immediate use, and the wicks tipped with spirits of turpentine; a box of lucifer-matches inside.

The apparatus having been brought to the spot required, and the communication effected, the stay should be hauled on board by means of the whip, with the tallies attached; and the stay being made fast on board the wreck, it should be set up to the cart, which should be secured in the following manner: a hole having been dug in the sand about a foot deep, the shafts should be let down into it, and the back-board laid across their ends, having been secured by means of the back chain; sand or earth should be piled on the board, and the cart filled with sand; a span should be formed with the end of the stay, a clove hitch to be taken over the outside of the nave, the end having been passed between the spokes behind the nave under the axle; the other end should be secured in the same manner; the luff-tackle should be hooked to this span, and the stay set up. This plan has been found sufficient to bring home a shovel-fluked anchor backed by four pickets, dragging the anchor and breaking the pickets short off. The hinder part of the wheels should be made fast by a small piece of line to the hinder horns of the cart, to prevent their turning round; by adopting this method for setting up the stay, the anchor, pickets, and backing may be dispensed with, and the cart thus relieved of 2 cwt.

A can of phosphorated oil should accompany the cart, and in using the first line in the night if required, by removing the plug from the head of the tub, the oil could be poured in, and the tub being well shaken, the oil would diffuse itself between the parts of the line, and thereby render it luminous. As it is a matter of the greatest importance that simplicity and expedition should prevail in the use of the mortar, everything belonging to the apparatus should be attached to the cart; in order that no delay should take place in waiting for horses, a cross-piece, about 6 feet long, should be attached to underneath the shafts and lashed across their ends to the trace staples, and the cart moved off by manual labour. The duties for working the mortar and apparatus are arranged for four men; all others above that number being considered auxiliaries, having no responsible charge only under the direction of each of those four members whose duty it will be to assist.

The duties are divided as follows:—No. 1, to command, and to take charge of the mortar. No. 2, to take charge of the shot and lines. No. 3, the ammunition. No. 4, the stay-whip and tackle.

Exercise for Four Men to Manby's Mortar.—(Providing Stores.)

No. 1. Provides cart, linch-pins, back chain, mortar-bed, quoins, quadrant, and sees the gear safe on the cart.
No. 2. Provides 8 shots, 4 lines, 2 baskets and frames, a piece of sheep-skin, and hand-barrow.
No. 3. Provides magazine and powder, tube-box and tubes, powder-horn and powder, pistol and spare fitted flints, priming-wire and hammer.
No. 4. Provides stay-whip complete, tackle, shovel, traveller and slings, and a primed portfire.

To Boatbuilders, Shipwrights, &c.

Great loss of life having occurred from time to time on the coast of Northumberland, and elsewhere, by the upsetting of Life-boats, and especially in the case of the Shields Life-boat in December last, whereby 20 pilots were drowned, notice is hereby given. that with a view to the improvement of Boats to be employed for such purposes, His Grace the Duke of Northumberland offers the sum of One Hundred Guineas for the best model of a Life-boat, which may be sent to the Surveyor's Department, Admiralty, Somerset House, London, by the 1st day of February, 1851.

Captain Sir Baldwin W. Walker, K.C.B., Surveyor of the Navy, has consented to act as final referee in adjudging the reward, and has named the following Committee to examine the Models and conduct the requisite experiments:—

Captain Washington, R.N., F.R.S., Inspector of Harbours.
John Fincham, Esq., Master Shipwright at Portsmouth Dockyard.
Isaac Watts, Esq., Assistant Surveyor, Admiralty, Somerset House.
Commander Jerningham, of H.M.S. *Excellent*, late Inspecting Commander of Coast Guard at Great Yarmouth.
James Peake, Esq., Assistant Master Shipwright, Woolwich Dockyard.

And His Grace offers the further Sum of One Hundred Guineas for building a Life-boat according to the model which may be approved of.

It is considered that the chief objections to the present Life-boats, generally speaking, are:—

1. That they do not right themselves in the event of being upset.
2. That they are too heavy to be readily launched, or transported along the coast, in case of need.
3. That they do not free themselves of water fast enough.
4. That they are very expensive.

It is recommended that the models be made on the scale of one inch to a foot, and that they be accompanied by plans, specifications, and estimates. The models will not be detained beyond the 1st of April, in case the respective builders should wish to send them to the Great Industrial Exhibition of 1851.

London, October, 1850.

ABSTRACT of WRECKS for the Year 1850.

THE wrecks of British shipping in 1850, according to Lloyd's list, were 692 vessels of 127,188 tons.

The wrecks of British and Foreign vessels on the coasts and in the seas of the United Kingdom, in 1850, were 681, which may be thus classed:—

Total wrecks	277
Sunk through leaks or collisions	84
Abandoned	16
Stranded and damaged, so as to require to discharge cargo	304
Total	681

The number of casualties in each month were—

January	72	August	30
February	117	September	24
March	134	October	73
April	36	November	84
May	31	December	43
June	20		
July	17	Total	681

Of these wrecks, 240 occurred on the east coast of Great Britain, 60 on the south coast, and 190 on the west coast. The north-west gale of the 5th and 6th February caused 47 wrecks; the south-east gale of the 29th and 30th March caused 73 wrecks; the south-south-west gale of the 7th and 8th October caused 30 wrecks; and the north-north-west gale of the 19th and 20th November caused 32 wrecks. In the month of March alone 134 wrecks occurred, or upwards of 4 a-day on an average of the whole month.

The number of lives lost, as far as can be ascertained, was 784.

Of these, 12 were lost in the ship *Hottinguer*, wrecked on the Blackwater bank, on the east coast of Wexford, on the 13th of January: 10 in the *Thetis*, wrecked on Cardigan bar, on the 6th of February; 206 were lost in the *Royal Adelaide* steamer, on the Tongue Sand, at the entrance of the Thames, on the 30th of March; 41 were lost in the *Orion* steamer, off Portpatrick, on the 18th June; 19 in the *Superb* steamer, wrecked on the Minquiers, off Jersey, on the 24th of September; 99 in the bark *Edmond*, wrecked in Killkee Bay, County Clare, on the west coast of Ireland, on the 20th of November; 14 in the *Gazelle*, supposed to have been lost on the Goodwin Sands, on the 24th of November; and a boat's crew of 11 men, who put off from Worthing to give assistance to the *Lalla Rookh*, on the 25th of November, making a total of 412. The remaining 372 were lost in smaller numbers, including an estimate for those vessels which are reported to have been lost with all hands, and of which no further information could be obtained.

LIST of the LIFE-BOATS, LIFE-ROCKETS, and MORTARS, placed around the Coast of the UNITED KINGDOM, with Admiralty in 1848,

*** The mortars and lines, &c., were supplied by Government; generally about the year 1825. The rockets, in many cases, by local subscription.

STATIONS.	Distance from last Station.	By what Funds Placed and Supported.	LIFE-BOATS.								Name of Builder.
			Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
BERWICK—Spittal	..	Local subscription	26	6¼	2½	6	64	..	1835	14	Harton, of Limehouse, after Mr. Palmer.
Goswick	5	. . .	..	..	..	..	..	..	..	..	. . .
Holy Island	4	Lord Crewe's trustees	32½	10½	3½	12	..	95	..	many	, Shields
Old Law Beacons	½	National Shipwreck Institution.	..	..	..	..	..	..	..	..	. . .
Ross Links	3	Trinity House, Newcastle	24	8	2½	8	..	..	..	many	Littlejohn, of Spittal
Farn Islands	..	. . .	..	..	..	..	..	..	..	..	. . .
Staples	..	. . .	..	..	..	..	..	..	..	..	. . .
Bamboro' Castle	3	Lord Crewe's trustees	..	..	..	..	..	..	..	..	. . .
North Sunderland	3½	National Shipwreck Institution.	27	6	2½	6	90	18	1827	..	Shore, after Foulerton
Beadnell	2	Newcastle Association	..	..	..	..	..	..	..	..	. . .
Newton-by-the-Sea	2	. . .	..	..	..	..	..	..	..	..	. . .
Craster	3½	. . .	..	..	..	..	..	..	..	..	. . .
Howick Sea Houses	1½	,, ,,	..	..	..	..	..	..	..	..	. . .
Boulmer	1½	National Shipwreck Institution.	27½	8½	3	10	150	..	1825	..	Clarke, of Newcastle
Alnmouth	2½	,, ,,	..	..	..	..	..	..	..	..	. . .
Coquet Island	..	. . .	..	..	..	..	..	..	..	..	. . .
Amble	..	National Shipwreck Institution.	27	8½	3½	10	..	..	1828	..	Wake, of Sunderland
Hauxley	4½	. . .	..	..	..	..	..	..	..	..	. . .
Cresswell	5½	. . .	..	..	..	..	..	..	..	..	. . .
Newbiggin	3½	. . .	..	..	..	..	..	..	..	..	. . .
Blyth	3½	Small toll on vessels entering	32	10¾	4	12	175	..	1845	..	Oliver, of South Shields
Seaton or Hartley Sluice	3	. . .	..	..	..	..	..	..	..	..	. . .
Cullercoats	3½	. . .	..	..	..	..	..	..	..	..	. . .
Tynemouth Haven	1½	National Shipwreck Institution.	..	..	..	..	60	..	1832	..	. . .
North Shields	½	Small toll on vessels entering	33	11	3¾	14	200	..	1845	many	Anderson, of North Shields
South Shields	½	,, ,, . . .	34	10	3½	14	234	..	1845	..	Woodhouse, of South Shields.
,,	..	,, ,, . . .	30	10	3¼	12	170	40	1830	..	Oliver, of South Shields
Whitburn	4½	Rev. Thomas Baker and others.	27½	9½	3½	10	100	20	1830	68	Thos. Wake, of Sunderland
SUNDERLAND—North Side	2	Local Subscription	27½	9¼	3¼	10	..	..	1831	..	William Wake, jun., Bishops Wearmouth.
South Side, No. 1	..	,,	26	9½	3¾	10	120	30	1819	many	Wake, of Sunderland
South Side, No. 2	..	,,	34	10½	3¼	14	130	40	1850	..	Thos. Wake and Son, Sunderland.
Seaham	..	. . .	..	..	..	..	..	..	..	..	. . .
Blackhalls	11	. . .	..	..	..	..	..	..	..	..	. . .
Hartlepool (north shore)	2	6*d.* on each outward-bound vessel	30	10	3½	14	165	50	1841	many	Cambridge, of Hartlepool.
,, (pier)	3	,, ,,	27¼	9¾	3½	12	100	40	1836	,,	Wake, of Sunderland
,, (west dock)	1	West Harbour and Dock Co.	30	10¼	4	12	160	40	1847	46	Cambridge, of Hartlepool.
Seaton Carew	2½	Local subscription	26¼	9½	3½	10	120	30	1823	..	Wake, of Sunderland
Tees-Mouth	..	Tees Bay Life Boat Society	31	10½	3¾	10	200	..	1802	many	Greathead, of Shields
Redcar	2½	,, ,,	31	10½	3¼	10	200	..	1844	..	Gale, of Whitby
Saltburn	..	,, ,,	30	10	3½	10	160	40	1849	..	. . .
Staithes	9	. . .	..	..	..	..	..	..	..	..	. . .
Kettleness	..	. . .	..	..	..	..	..	..	..	..	. . .
WHITBY	11	Local subscription	26½	9¼	3½	10	100	30	1822	many	, Sunderland
Robin Hood's Bay	7	,,	28	10	3½	10	100	30	1839	3	Gale, of Whitby
Cloughton	8	. . .	..	..	..	..	..	..	..	..	. . .
Burniston	2	. . .	..	..	..	..	..	..	..	..	. . .
Scarborough	3	Local subscription	28	9	3½	10	85	..	1823	many	Skelton, of Scarborough
Cayton Bay	2	. . .	..	..	..	..	..	..	..	..	. . .
Filey	7	Local subscription	29	8½	3½	12	94	70	1823	..	Skelton, of Scarborough
Flamborough Head	12	. . .	..	..	..	..	..	..	..	..	. . .
BRIDLINGTON	5	National Shipwreck Institution.	28	8¾	4	12	120	..	1824	..	Skelton, of Scarborough
Atwick	11	. . .	..	..	..	..	..	..	..	..	. . .
Hornsea	3	. . .	..	..	..	..	..	..	..	..	. . .
Mappleton	3	. . .	..	..	..	..	..	..	..	..	. . .
Aldbro'	3	. . .	..	..	..	..	..	..	..	..	. . .
Sand-le-mer	6	Trinity House, Hull	..	..	..	..	..	..	..	..	. . .

some Account of their State and Condition; chiefly from the Returns of the Officers of the Coast Guard to the and from other sources.

*** In Rocket Column, D, signifies DENNETT, of the Isle of Wight; C. CARTE, Ordnance Storekeeper, at Hull.

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved.	
	lbs.					lbs.		
4	9	D	1840	..	1	24	..	Life-boat in fair repair; 50 yards from high water; wrecks frequent. No mortar lines, &c.; two rockets have burst, and lines have broken. The hide thongs of the shot are rotten; they should be of Manilla rope.
					1	6		
..	..	..	..	..	..	..	..	Three rockets, with lines and stand, should be placed here.
..	..	..	..	..	..	..	..	In good repair, but very heavy; close to high water; wrecks frequent; only two rocket staves left.
8	9	D	1835	..	1	24	3	The whole coast from Berwick to Tynemouth will be completed with life-boats, rockets, &c., at the expense of the Duke of Northumberland, or Lord Crewe's trustees.
					1	6		
..	..	..	..	..	..	..	..	Life-boat in fair repair, but requires overhauling.
..	..	..	..	..	..	..	..	Recommended that rockets be placed here.
..	..	..	..	..	..	..	..	Rockets recommended.
6	9	D	1838	..	2	24	..	
					2	6		
..	..	..	..	..	..	..	..	Life-boat quite out of repair; a new boat will be placed here. Rockets recommended.
12	9	D	1835	..	..	..	..	In charge of the Rev. J. Wood.
..	..	..	..	..	2	24	..	The whole of the cordage unserviceable from age. Supplied in 1825.
..	..	..	..	..	..	..	..	Rockets recommended here.
4	9	D	1835	..	..	..	..	These rockets are in a granary some distance from the beach; they should be in the Coast Guard Watchhouse at Craster. There are no staves; no trigger line.
..	..	..	..	..	..	..	..	Life-boat in fair repair, but very leaky; said to weigh four tons. Boat-house 30 yards from high water. Rockets recommended. Life boat will be repaired or replaced.
11	9	D	1836	..	..	..	..	In charge of Coast Guard, and in good order.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	1	24	..	Life-boat not safe, and in bad repair; upset and drowned 10 men at Blyth in October, 1841; air-cases under flat. Boat-house in a bad position; should be at Hauxley.
					1	6		
..	..	..	..	..	..	..	..	It is proposed to place a life boat and rockets here instead of at Amble, at the expense of the Duke of Northumberland.
..	..	..	..	..	1	24	..	The mortar and shot in one place, the lines in another; the hide thongs unserviceable; supplied in 1829. Rockets recommended here in addition, and to be placed close to the beach.
					1	6		
..	..	..	..	..	1	24	..	In March, 1851, three fishing cobles were upset, and 11 men drowned. It is proposed to place a life-boat and rockets here. Mortar supplied in 1825; the rope unserviceable.
					1	6		
6	9	D	1835	..	..	..	..	Life-boat in good repair, but heavy. The rockets should be transferred to the Coast Guard Watch-house.
6	9	D	1835	..	..	..	..	In fair order; requires looking after.
..	..	..	..	..	..	..	..	In 1848, a coble with 7 pilots, in going off to assist a vessel, upset and all drowned. A life-boat and rockets will be placed here, at the expense of the Duke of Northumberland.
10	9	D	1837	..	2	24	50	The life-boat placed here in 1832 upset, and is destroyed. The rockets, under charge of Captain Cunningham, are in good order. The mortars are in charge of the Coast Guard.
..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	This boat turned end over end in December, 1849, and drowned 20 pilots.
..	..	..	..	..	..	..	..	The three Shields boats have gone out 84 times, and saved 493 lives in the last 11 years.
10	6	C	1842	..	..	..	..	Life-boat about to be repaired; has saved 68 lives in 20 years. Here are four rocket lines of 320 yards each.
..	..	..	..	..	..	..	..	
12	9	D	1837	11	1	24	..	Rockets placed here sooner might have saved many lives.
					1	4		
8	6	C	..	..	..	..	..	This boat has 15 cwt. of water-ballast; area of delivering tubes 80 sq. inches. Buoyancy given by air-cases under the flat and round the sides.
..	..	..	..	..	..	..	..	
..	..	..	..	..	1	24	..	
..	..	..	..	..	..	..	..	Life-boat in good repair.
16	6	C	1841	..	..	..	..	Life-boat in good repair. In 1846 as many as 39 vessels were stranded in Hartlepool Bay, and 12 in 1850.
..	..	..	..	..	..	..	..	Life-boat in good repair.
4	6	C	1841	..	..	..	..	Life-boat in good repair.
..	..	..	..	..	..	..	..	In fair repair. 200 lives said to have been saved by life-boat since 1802.
..	..	..	..	..	..	..	..	In good repair. Mortar much required.
5	6	C	1845	..	..	..	..	Life-boat placed in 1849. Skinningrove should have rockets or a mortar.
8	12	C	1847	..	..	..	..	
8	6	C	..	..	..	..	..	
..	12	C	1843	..	1	24	..	Life-boat in 1835 upset and drowned four men. Mortar weighs 11 cwt.; requires a cart to transport it.
	6	D	1846					
8	12	C	1846	..	1	6	..	Life-boat in fair repair. This boat upset in 1843, and drowned 12 men.
8	6	C	1838	..	..	..	..	
8	6	C	1838	..	..	..	..	
set	12	C	1838	..	1	24	..	In fair repair. This boat capsized end over end in 1836, and drowned 10 men. One iron mortar, 24 pounder, weighs 11 cwt.
	6				1	6		
,,	6	C	1838	..	..	..	..	
	3							
6	9	C	1834	..	1	24	20	In good repair. Mortar used 14 times.
	6				1	6		
set	9	D	..	..	1	6	..	
	6	C						
18	12	C	..	many	1	24	many	In fair repair. Maintained by 6*d.* on each vessel entering.
	6	D			1	6		
8	6	C	..	..	..	..	..	
4	12	C	1845	..	1	24	5	O'Reilly's fuse for the shell has been used with great success at this station.
					1	6		
8	6	C	..	..	..	..	..	
8	6	C	..	..	..	..	..	
set	12	C	1842	..	1	24	..	Mortar weighs 11 cwt.; requires a cart. Saved several lives.
	9	D	1845		1	6		

List of the Life-Boats, Life-Rockets, and Mortars, placed

Stations.	Distance from last Station.	By what Funds Placed and Supported.	Life-Boats. Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	Name of Builder.
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
Holmpton	6		..	..	..	..	..	..	..	..	
Easington	3		..	..	..	..	..	..	..	..	
Spurn Point	6	Trinity House, Hull	30	10	3¾	10	..	..	1824	many	Mason, of Hull
Patrington	10		..	..	..	..	..	..	..	..	
Grimsby—Tetney	10		..	..	..	..	..	..	..	..	
Donna Nook	5	Lincolnshire Shipwreck Association.	28	7	2	8	100	45	..	many	Bell and Co., of Grimsby
Theddlethorpe	8	,, ,, ,,	22	7	2½	10	..	30	1833	,,	
Sutton	6	,, ,, ,,	24	7	2½	8	110	..	1824	7	Bell and Grange, of Grimsby
Skegness	11	National Shipwreck Institution	24	8	3	8	130	40	1825	..	Plenty, of Newbury
Hunstanton	15		..	..	..	..	..	..	..	..	
Wells	15	Norfolk Shipwreck Association	25	8½	2¾	10	..	..	..	..	
Weybourne	11		..	..	..	..	..	..	..	..	
Sherringham	3	Hon. Mrs. Upcher	33	10¼	4½	16	150	..	..	..	Sunmam, of Sherringham
Cromer	4	Norfolk Association	31	9½	3¾	12	160	..	1830	many	Robson, of Shields
Sidestrand	3		..	..	..	..	.	..	..	..	
Mundesley	3	Norfolk Association	26	9½	3½	10	130	..	..	..	, Sunderland
Bacton	3	,, ,,	29½	11¾	3	12	..	..	..	..	
Happisburgh	3		..	..	..	..	..	..	..	..	
Palling	4		..	..	..	..	..	..	..	..	
Winterton	6	Norfolk Life Association	32	10½	3	12	..	80	1822	..	
Caister	6	,, ,, ,,	42	11½	3½	16	250	95	1846	18	Branford, of Yarmouth
North Yarmouth	3	,, ,, ,,	39	10	3	14	..	95	1833	many	Holmes, of Yarmouth
,,	..	,, ,, ,,	25	8	2½	..	..	60	1833	..	Branford. of Yarmouth
Corton	8		..	..	..	..	..	..	..	..	
Lowestoft	3	Suffolk Humane Society	40	10½	3 12	14	200	100	1807	300	Bareham, of Lowestoft
Pakefield	2	,, ,,	45	11	3¼	16	300	120	1841	16	Teasdel, of Yarmouth
Kessingland	2		..	..	..	..	..	..	..	..	
Southwold	8	Suffolk Humane Society	40	11	3½	12	400	..	1841	many	Teasdel, of Yarmouth
Sizewell Gap	4	Suffolk Association	24	8	3	8	168	..	1826	..	Plenty, of Newbury
Misner Haven	3½		..	..	..	..	..	..	..	..	
Aldborough	2		..	..	..	..	..	..	..	..	
Orfordness	5		..	..	..	..	..	..	..	..	
Orford Haven	6		..	..	..	..	..	..	..	..	
Woodbridge Haven	8		24	8	3	10	168	..	1826	4	Plenty, of Newbury
Harwich	5	Admiralty	28	7	2¾	12	..	40	1845	..	Thompson, of Rotherhithe
Sheerness, Garrison Point	45		..	..	..	..	..	..	..	..	
Broadstairs	33	Messrs. White, of Cowes	29½	6½	2½	12	..	12	18	7	White, of Cowes
Ramsgate	3		.	..	..	..	..	..	..	..	
Dover—Townsend	17	Dover Humane Society	37	7¼	2½	12	..	..	1837	..	Elvin, of Dover
Folkestone	7		..	..	..	..	..	..	..	..	
Tower, Dymchurch	10	National Shipwreck Institution.	..	..	..	..	60	..	1836	..	
Dungeness, Grand Redoubt.	8		..	..	..	..	..	..	..	..	
31 Mortella Tower, Rye.	10	National Shipwreck Institution	25	5¾	2¼	6	58	17	1832	10	Harton, of Limehouse
Hastings	10	Local subscription	..	..	..	..	..	..	..	..	
39 Tower	2		..	..	..	..	..	..	..	..	
Eastbourne	14	Mr. Fuller, Rose hill Court	25	8½	3¾	10	..	..	1822	44	Simpson, of Eastbourne
Birling Gap	7		..	..	..	..	..	..	..	..	
Blatchington	2		..	..	..	..	..	..	..	..	
Greenway	2		..	..	..	..	..	..	..	..	
Newhaven	2		..	..	..	..	..	..	..	..	
Brighton	9	National Shipwreck Institution	28¼	6¾	2½	10	70	..	1837	..	, Blackwall
,,	..	Town authorities	22	6½	2½	6	60	..	..	..	Johnston, of Hove
Shoreham	7	Shoreham Harbour Commissioners.	30	8¾	3½	12	100	..	1845	2	, Shoreham
Worthing	5		..	..	..	..	..	..	..	..	
Littlehampton	7		..	..	..	..	..	..	..	..	
Gosport	27		..	..	..	..	..	..	..	..	
Ryde	5		..	..	..	..	..	..	..	..	
St. Lawrence, Isle of Wight.	15	National Shipwreck Institution	..	..	..	..	..	..	..	..	
St. Catherine's Point	3		..	..	..	..	..	..	..	..	
Atherfield	4	Government	18½	7¼	2½	6	..	..	1843	14	Talbot, of Weymouth

* Buoyancy obtained by six 18-gallon casks lashed on each side between the thwarts, and seven casks placed upright under the thwarts; two high-water mark. Life-boat, in 1833, saved 29 persons from the *Isabella;* in 1843 saved six from the *Watt;* and on the 28th December the South Holland Shipwreck Institution was presented to Samuel Knight, jun., coxswain of the boat.

around the Coast of the United Kingdom—*continued*.

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved.	
	lbs.					lbs.		
7	{ 6 / 2 }	C	1838	..	..	..	..	
6	12	C	1836	..	..	..	..	
6	6	C	..	..	..	..	..	Life-boat pulls very heavy; cannot be got ahead against the tide; not thought safe; a lighter and faster pulling boat required.
..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	A small life-boat is recommended here.
1	6	C	1844	..	1	24	..	In good repair; pulls well. Four miles north of Saltfleet Station. These boats have Carte's sea-service rocket apparatus.
1	12	D	..	..	1	24	..	,, ,,
..	..	..	..	..	1	24	..	In fair repair; pulls fairly.
..	..	..	..	..	1	24	11	In fair repair; pulls fairly. Under charge of Mr. Samuel Moody.
..	..	..	..	..	..	..	..	A light boat would be useful here. There was formerly a heavy life-boat here, and the boat-house is still standing.
..	..	..	..	..	..	..	..	Kept in a boat-house at the west side of the entrance of Wells Harbour.
9	9	D	1837	1	2	{ 24 / 6 }	..	Rocket lines have broken.
11	9	D	1837	..	2	12	..	In good repair; pulls well; sails fairly. An anchor, for hauling the boat off, recommended.
12	9	D	..	..	1	..	..	Life-boat in good repair, safe, and pulls well; has saved many lives. Rockets have occassionally burst.
10	9	D	{ 1839 / 1847 }	..	..	..	..	Rockets also are kept always ready by Miss Gurney, at Northrepps Cottage.
2	9	D	1837	..	..	..	..	In good repair. Mortar belonging to Norfolk Association. Rocket lines have broken.
set	9	D	..	5	1	24	..	In good repair; not very safe; pulls well. Rockets have burst, and lines have broken, probably from damp. An anchor, for hauling the boat off, recommended.
set	9	D	1837	8	1	24	..	Rockets have burst and lines have broken.
set	9	D	1839	25	..	..	..	A life boat is proposed here. Rockets have burst, and lines have broken, probably from damp.
9	9	D	1835	..	1	24	..	No one will go afloat in this life-boat. Rockets have burst, and lines broken here. Iron mortar, weighs 11 cwt.
12	9	D	1846	..	1	24	many	Several rockets have burst.
12	9	D	..	..	1	24	..	Rockets burst occasionally.
..	..	..	..	..	..	..	..	
10	9	D	..	..	..	..	..	Rockets burst occasionally.
10	9	D	1841	..	1	24	many	Rockets have burst.
..	..	..	..	..	..	..	..	
12	9	D	1839	18	1	24	..	Rockets have burst. Mortar lines have broken.
12	9	D	1846	..	1	24	..	An anchor is laid out for hauling the boat off.
..	..	..	..	..	1	24	..	Life-boat slow, but safe. Requires slight repairs. No crew nearer than Aldbro', four miles off. Boat in charge of Coast Guard.
10	9	D	1841	..	..	..	..	
..	..	D	1841	..	1	24	..	From want of a life-boat the Coast Guard galley has gone off and saved life. Out of seven 9 lb. rockets supplied in 1841, five burst in firing in 1848. Mortar lines have frequently broken. O'Reilly's fuses are supplied, but the shells are not bored to receive them.
..	..	..	..	..	1	24	..	
2	9	D	1839	..	..	..	..	Rocket lines have broken.
..	..	..	..	..	1	4	2	Life-boat quite out of repair and unserviceable.
6	12	C	1845	..	{ 1 / 1 }	{ 24 / 6 }	..	The life-boat, rockets, and mortar are stationed at Languard Point, on the east side of Harwich Harbour. In four trials with the rocket, the line broke three times.
1	9	D	1846	..	2	24–6	..	The rockets burst on the only two occasions that they have been used at this station.
7	9	D	1839	..	..	..	..	This boat pulls and sails well. In March, 1851, this boat saved seven men from the *Mary White*, wrecked on the Goodwin Sand. The boat is the liberal gift of the Messrs. White, of Cowes, to their native place.
..	..	..	..	..	..	..	..	The Fishermen's Benevolent Society propose to establish a life-boat at Ramsgate forthwith.
10	9	D	1840	..	2	24–6	..	Life-boat in good repair; safe; pulls well; boat-house 80 yards from high-water mark. Wrecks usually occur at Lyddon Spout, three miles west of Dover. Mortar lines have broken five times.
7	9	D	1837	..	..	..	..	
..	..	..	..	..	2	24–6	..	Dymchurch life-boat is become unserviceable.
7	9	D	1841	..	..	..	..	Wrecks are of frequent occurrence in Dungeness East and West Bays. Six wrecks occurred in each bay in the year 1850. A life-boat is required here.
..	..	..	..	..	..	..	..	Life-boat in fair repair; not considered safe. In charge of the Coast Guard.
..	..	..	..	..	..	..	..	Life-boat out of repair.
..	..	..	..	..	1	24	..	Mortar lines have broken.
18	9	D	1837	..	..	..	..	*Life-boat in good repair; pulls well; safe. A liberal gift of A. E. Fuller, Esq., M.P., of Rose-hill Court.
..	..	..	..	..	{ 2 / 1 }	{ 24 / 6 }	..	Mortar lines break occasionally. O'Reilly's fuses are supplied.
..	..	..	..	..	{ 2 / 1 }	{ 24 / 6 }	..	Mortar lines break occasionally. O'Reilly's fuses.
..	..	..	..	..	{ 2 / 1 }	{ 24 / 6 }	5	Mortar very heavy.
..	..	..	..	..	..	..	..	It is suggested to place a life-boat here.
12	9	D	1837	..	..	..	..	In good repair; safe; pulls well.
..	..	..	..	..	..	..	..	In good repair; small.
15	6	D	1847	..	..	..	..	Life-boat in good repair; safe; pulls well. Built at Shoreham, on a plan by Costain, of Liverpool.
..	..	..	..	..	..	..	..	A boat upset, and 11 men drowned here in November, 1850, in going off to a vessel in distress. It is proposed to place a life-boat here by the National Shipwreck Institution.
..	..	..	..	..	1	6	..	11 Coast Guard stations.
..	..	..	..	..	..	..	..	17 Coast Guard stations.
..	..	..	..	..	..	..	..	Five Coast Guard stations.
4	3	D	1839	..	1	24	..	Rocket lines have broken.
12	8	D	1843	..	1	24	..	A life-boat at Puckaster Cove might be of service. Many rockets have burst; some lines have broken; many mortar-lines have broken.
12	9	D	1843-7	12	1	24	..	This is the well-known fishing-boat called the *Portland Laurette*, not fitted as a life-boat.

delivering-tubes of 2 inches diam. each; an iron keel. In charge of Samuel Knight, jun. Has a carriage; boat-house a quarter of a mile from 1845, rescued 10 men from the *Twee Cornelissen*, Dutch East Indiaman, stranded in Pevensey Bay. For this last service the silver medal of

List of the Life-Boats, Life-Rockets, and Mortars, placed

Stations.	Distance from last Station.	By what Funds Placed and Supported.	Life-Boats.								Name of Builder.
			Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
Brook	5	Government	18	..	..	6	..	..	..	Many	. . .
Christchurch	15	. . .	..	..	..	..	..	..	..	..	. . .
Barton Cliff	4	. . .	..	..	..	..	..	..	..	..	. . .
Studland	5	Local subscription	20	7	3	8	..	..	1826	..	Plenty, of Newbury . . .
Flag Head	2	. . .	..	..	..	..	..	..	..	..	. . .
Swanage	2	. . .	..	..	..	..	..	..	..	..	. . .
St. Alban's Head	6	. . .	..	..	..	..	..	..	..	..	. . .
Kimmeridge	4	. . .	..	..	..	..	..	..	..	..	. . .
Portland	15	Local subscription	20	6¾	3	6	..	..	1825	..	Plenty, of Newbury . . .
Langton	10	. . .	..	..	..	..	..	..	..	..	. . .
Abbotsbury	2	. . .	..	..	..	..	..	..	..	..	. . .
Burton	6	. . .	..	..	..	..	..	..	..	..	. . .
Bridport	2	. . .	..	..	..	..	..	..	..	..	. . .
Lyme Cobb	7	. . .	..	..	..	..	..	..	..	..	. . .
Sidmouth	14	. . .	..	..	..	..	..	..	..	..	. . .
Budleigh Salterton	5	. . .	..	..	..	..	..	..	..	..	. . .
Exmouth	5	. . .	..	..	..	..	..	..	..	..	. . .
Teignmouth	6	. . .	..	..	..	..	..	..	..	..	. . .
Torcross	7	. . .	..	..	..	..	..	..	..	..	. . .
Paington	2	. . .	..	..	..	..	..	..	..	..	. . .
Dartmouth	8	. . .	.	..	..	..	..	..	..	..	. . .
Salcombe	14	. . .	..	..	..	..	..	..	..	..	. . .
Challoborough	5	. . .	..	..	..	..	..	..	..	..	. . .
Mothecombe	3	. . .	..	..	..	..	..	..	..	..	. . .
Plymouth	12	. . .	..	..	..	..	..	..	..	..	. . .
Portwrinkle	10	. . .	..	..	..	..	..	..	..	..	. . .
Fowey	16	. . .	..	..	..	..	..	..	..	..	. . .
Falmouth	20	. . .	..	..	..	..	..	..	..	..	. . .
Port Mullion	25	. . .	..	..	..	..	..	..	..	..	. . .
Port Leven	4½	. . .	..	..	..	..	..	..	..	..	. . .
Prussia Cove	3½	. . .	..	..	..	..	..	..	..	..	. . .
Marazion	3½	. . .	..	..	..	..	..	..	..	..	. . .
Penzance	3	National Shipwreck Institution	..	..	..	..	..	..	..	..	. . .
Mousehole	4	. . .	..	..	..	..	..	..	..	..	. . .
Penberth	5	. . .	..	..	..	..	..	..	..	..	. . .
Sennen Cove (Land's End)	6	National Shipwreck Institution	..	..	..	..	..	..	1851	..	. . .
Priest Cove, St. Just	3	. . .	..	..	..	..	..	..	..	..	. . .
Pendeen Cove	4½	. . .	..	..	..	..	..	..	..	..	. . .
Zennon	5½	. . .	..	..	..	..	..	..	..	..	. . .
St. Ives	4	Local subscription	30	5¾	2¼	8	150	..	1836	..	Adams, of St. Ives . . .
Lelant	5	. . .	..	..	..	..	..	..	..	..	. . .
Scilly	..	. . .	..	..	..	..	..	..	..	..	. . .
St. Mary's	..	National Shipwreck Institution	26	8½	2¼	10	150	20	1828	..	Plenty, of Newbury . . .
Gwithian	5	. . .	..	..	..	..	..	..	..	..	. . .
Portreath	5½	. . .	..	..	..	..	..	..	..	..	. . .
St. Agnes	6½	. . .	..	..	..	..	..	..	..	..	. . .
Holywell	5½	. . .	..	..	..	..	..	..	..	..	. . .
Newquay	5½	. . .	..	..	..	..	..	..	..	..	. . .
Mawganporth	6½	. . .	..	..	..	..	..	..	..	..	. . .
Padstow Harbour, West Cove.	7½	Harbour Trustees	23	6½	2½	4	50	..	..	..	Tredwen, of Padstow . . .
Trebithnick	2	. . .	..	..	..	..	..	..	..	..	. . .
Port Isaac	8	. . .	..	..	..	..	..	..	..	..	. . .
Tintagel Head	6	. . .	..	..	..	..	..	..	..	..	. . .
Boscastle	6	. . .	..	..	..	..	..	..	..	..	. . .
Carnbeak	6	. . .	..	..	..	..	..	..	..	..	. . .
Millock	6	. . .	..	..	..	..	..	..	..	..	. . .
Bude	4	King William IV.	24¾	8	3	8	100	..	..	..	Wake, of Sunderland . . .
Barnstaple — Hartland Quay.	6	. . .	..	..	..	..	..	..	..	..	. . .
Shipload Bay	5	. . .	..	..	..	..	..	..	..	..	. . .
Clovelly	5	. . .	..	..	..	..	..	..	..	..	. . .
Horncross	5	. . .	..	..	..	..	..	..	..	..	. . .
Abbotsham	3½	. . .	..	..	..	..	..	..	..	..	. . .
Appledore, No. 1	3½	North Devon Association	30	7	2¾	12	125	60	1850	..	Thompson, of Rotherhithe .
,, No. 2	..	National Shipwreck Institution	17	6¼	2½	4	90	20	1826	67	Plenty, of Newbury . . .
Braunton Sands, No. 3	1⅛	,, ,,	26	6	2½	6	65	20	1831	..	. . .
Bechorn Farm	5	. . .	..	..	..	..	..	..	..	..	. . .
Morte Bay	5	. . .	..	..	..	..	..	..	..	..	. . .
Ilfracombe	5	Local subscription	32	8	3¼	12	144	..	1850	..	T. and J. White, of Cowes .
Coombe Martin	4½	. . .	..	..	..	..	..	..	..	..	. . .
Edenmouth	6	. . .	..	..	..	..	..	..	..	..	. . .
Lynmouth	4½	. . .	..	..	..	..	..	..	..	..	. . .
Bridgewater	40	. . .	..	..	..	..	..	..	..	..	. . .

around the Coast of the United Kingdom—*continued.*

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved.	
	lbs.					lbs.		
12	9	D	1845	..	1	24	..	A fine boat; has saved many lives, but is not fitted as a life-boat. Two rockets burst in trying to communicate with H.M.S. *Sphynx*, in 1847.
..	..	..	..	..	1 1	24 6	..	
12	9	D	1844	..	..	..	..	A rocket-line broke, from being defective.
..	..	..	..	..	..	..	..	Not worth repair.
..	..	..	..	..	1	6	..	
15	6	D	1842	..	..	..	..	
15	6	D	1842	..	..	..	..	
12	9	D	1842	..	..	..	..	
..	..	..	..	..	..	..	..	Not worth repair; air-boxes warped and leaky.
8	12	C	..	..	..	..	..	
8	6	D	1844	..	..	..	..	Rockets recommended on Seaton Beach.
..	..	..	..	..	1	6	7	Saved seven lives at Abbotsbury.
..	..	..	..	..	2	6	Many	Mortar saved five lives on one occasion, and many others at different times.
..	..	..	..	..	1	24	..	Mortar apparatus very unwieldy.
..	..	..	..	..	1	24	..	
..	..	..	..	..	..	..	..	Rockets or a mortar required here.
..	..	..	..	..	1	24	..	There is no apparatus with this mortar.
..	..	..	..	..	1	24	16	A life-boat proposed here by the Fishermen's Benevolent Society. A 6-pounder mortar required at Shaldon.
..	..	..	..	..	1	24	.	
..	..	..	..	..	1	24	17	Mortar has saved 17 lives from two wrecks. O'Reilly's fuses are supplied.
..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	Six Coast Guard stations.
..	..	..	..	..	1	24	..	Supplied with O'Reilly's fuses.
..	..	..	..	..	..	..	..	Four wrecks in 1846-7; crew of one saved by the Coast Guard men swimming out to catch a cask and line veered from the wreck.
..	..	..	..	..	..	..	..	Seven Coast Guard stations.
..	..	..	..	..	1	24	..	Mortar-lines have broken.
..	..	..	..	..	..	..	..	Eight Coast Guard stations.
..	..	..	..	..	..	..	..	Seven Coast Guard stations.
..	..	..	..	..	..	..	..	Life-boat desirable. Rockets absolutely necessary.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	1	24	..	Supplied with O'Reilly's fuses.
..	..	..	..	..	..	..	..	Rockets recommended.
8	9	D	1850	..	1	24	..	Six Coast Guard stations. The life-boat stationed here was wrecked. It is proposed to replace it forthwith.
..	..	D	1850	..	..	..	..	Rockets recommended.
12	9	..	1851	..	..	..	..	
12	9	D	1851	..	..	..	..	A life-boat much wanted here. It will be placed forthwith by the National Shipwreck Institution.
..	..	..	..	..	..	..	..	Rockets recommended.
12	9	D	1851	..	..	..	..	
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	1	24	..	Life-boat kept under a shed 400 yards from high-water mark, in charge of Mr. Hockin. With slight repairs, and proper internal fittings, might be made a useful boat. No boat-house; no carriage.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	..	..	..	Four Coast Guard stations. } A set of good rockets would be of great service in the Scilly Islands.
11	8	D	1844	4	1 1	24 6	..	In good repair; pulls fairly. }
..	..	..	..	..	..	..	..	Rockets very desirable.
12	9	D	1844	..	1 1	24 6	..	Pilot or hovelling-boat might be fitted as a life-boat. Rockets have burst and lines have broken. Supplied with O'Reilly's fuses.
10	6	D	1844	..	..	..	..	Rocket line broke short off.
..	..	..	..	..	..	..	..	Rockets very desirable.
9	9	D	1843	..	..	..	..	It is proposed to place a life-boat here.
12	9	D	1850	..	..	..	..	
9	9	D	1837	6	2 2	24 12	..	In fair repair.
..	..	..	..	..	..	24–6	..	At east side of Padstow Harbour.
12	9	D	1850	..	2	24–6	..	
..	..	..	..	..	..	..	..	Rockets recommended.
12	6	D	1844	..	..	..	..	
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	..	..	..	Rockets recommended. This is a bold beach, and a life-boat could be more readily got out than at Bude, four miles to the east.
13	9	D	1836	11	1 1	24 6	..	In bad repair and neglected. In 1844 turned *end over end*, and drowned two of her crew. A good boat-house built by Sir Thomas Acland, Bart., M.P.
..	..	..	..	..	..	..	..	Rockets absolutely necessary.
..	..	..	..	..	..	..	..	Rockets desirable.
..	..	..	..	..	1	24	..	
..	..	..	..	..	..	..	..	} Rockets desirable between these two stations.
..	..	..	..	..	..	..	..	
11	3	D	1840	..	..	..	..	In good repair; pulls fairly. The Appledore boats are under charge of a Local Committee and Mr. Burt, of the Customs. Rockets too small.
..	..	..	..	..	..	..	..	In good repair; safe, but small.
..	..	..	..	..	..	..	..	In good repair; pulls fairly, but turned end over end in 1833, and drowned three of her crew.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	1	24	..	Seven wrecks occurred in Morte Bay in 1850. Rockets recommended.
..	..	..	..	..	1	24	..	A fine boat; pulls and sails well. In charge of Mr. Huxtable, Lloyd's agent.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	..	..	..	Rockets recommended.
..	..	..	..	..	1	24	5	
..	..	..	..	..	..	..	..	Three stations.

List of the Life Boats, Life Rockets, and Mortars, placed

Stations.	Distance from last Station.	By what Funds Placed and Supported.	Life-Boats. Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	Name of Builder.
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
Burnham	8	Corporation of Bridgewater	26	10½	3¼	10	115	35	1847	3	Gale, of Whitby
Penarth—Cardiff	16		..	..	..	..	..	..	..	..	
Porthcawl	30		..	..	..	..	..	..	..	..	
Swansea	15	Harbour Trust	28	9	4¾	12	120	..	..	..	
Llanelly and Bury Port	30		..	..	..	..	..	..	..	..	
Carmarthen	15		..	..	..	..	..	..	..	..	
Tenby	15		..	..	..	..	..	..	..	..	
Milford Haven	25		..	..	..	..	..	..	..	..	
St. David's	25		..	..	..	..	..	..	..	..	
Fishguard	25	Capt. T. Evans, R.N.	25	8	3	10	95	..	1822	30	At Fishguard, after a model by Capt. Evans.
Cardigan	15	Local subscription	27	8	3	8	116	15	1849	2	T. and J. White, of Cowes
New Quay, Cardigan	15		..	..	..	..	..	..	..	..	
Aberystwith	20	Local subscription	26¾	6¼	2½	6	..	18	1843	..	
Aberdovey	8	,,	26	6	2¾	6	68	18	1837	..	Tayler, after Palmer
Barmouth	15	Harbour Trust	26	6	2¼	6	56	18	1828	..	Harton, after Palmer
Penrhyn Du	20	Local subscription	26	6	2½	6	72	18	1844	..	
Carnarvon	45	Harbour Trust	23	8	3½	10	..	..	1844	..	Costain, of Liverpool
Anglesea — Llanddwyn Point.	5	Anglesea Shipwreck Society, and Carnarvon Harbour Trust.	27	8	4	6	..	..	..	..	
Molfre	..	National Shipwreck Institution	26	6	2½	6	60	..	1830	..	
Rhoscolyn	12	Local subscription	26¼	6	2¼	6	60	..	..	..	
Holyhead	10	,,	31½	6¾	2½	8	80	..	..	..	
Cemlyn	10	National Shipwreck Institution	26¼	6	2¼	6	55	..	1828	..	Harton, after Palmer
Trwyndu, or Point Penmon	22	,, ,,	25¼	5¾	2¼	6	60	..	1830	..	
Rhyl	23		..	..	..	..	..	..	..	..	
Liverpool (2 boats)	25	Liverpool Dock Trust	30	9¼	4	12	180	37	1840		Costain, of Liverpool
Magazines (2 boats)	..	,,	,,	,,	,,	,,	,,	,,	,,		
Hoylake (2 boats)	10	,,	,,	,,	,,	,,	,,	,,	,,	1128	
Formby (1 boat)	10	,,	,,	,,	,,	,,	,,	,,	,,		
Point of Ayr (2 boats)	8	,,	26¾	8¼	3¼	10	..	..	..		
Southport, North Meals	9	,,	30	8¼	3½	10	120	35	1840	70	Cato, of Liverpool
Lytham	6		..	..	..	..	..	..	..	..	
Blackpool	4		..	..	..	..	..	..	..	..	
Barrow—Furness	25		..	..	..	..	..	..	..	..	
Whitehaven	35	Harbour Trust	28	10	2¼	12	..	..	..	..	
Isle of Man, Douglas	45	Public subscription, and Sir J. W. Hillary, Bart.	29	10	4	10	70	..	1826	..	
Peel	30	,, ,,	26	6¼	..	6	..	..	..	..	
Ramsay	15	,, ,,	28	6¾	3	12	55	..	1828	..	Harton, after Palmer

IRELAND.

Ballycastle	84		..	..	..	..	..	..	..	..	
Port Rush	..		..	..	..	..	..	..	..	..	
Garron Point	..		..	..	..	..	..	..	..	..	
Carrickfergus	94		..	..	..	..	..	..	..	..	
Donaghadee	45		..	..	..	..	..	..	..	..	
Ballywalter	..		..	..	..	..	..	..	..	..	
Strangford	15		..	..	..	..	..	..	..	..	
Newcastle	36		..	..	..	..	..	..	..	..	
Ardglass	..		..	..	..	..	..	..	..	..	
St. John's Point	..		..	..	..	..	..	..	..	..	
Tyrella	..	Board of Public Works	22	7	3	8	..	25	1839	..	
Newcastle	..		..	..	..	..	..	..	..	..	
Dundrum	..		..	..	..	..	..	..	..	..	
Annalong	..		..	..	..	..	..	..	..	..	
Carlingford	36		..	..	..	..	..	..	..	..	
Cranfield Point	..		..	..	..	..	..	..	..	..	
Dundalk	36		..	..	..	..	..	..	..	..	
Cooley Point	..		..	..	..	..	..	..	..	..	
Malahide	62		..	..	..	..	..	..	..	..	
Balbriggan	..		..	..	..	..	..	..	..	..	
Skerries	..		..	..	..	..	..	..	..	..	
Baldoyle	..		..	..	..	..	..	..	..	..	
Howth	..	Ballast Board, Dublin	27½	7½	3½	10	..	50	..	..	
Dublin	29		..	..	..	..	..	..	..	..	
Poolbeg	..	Ballast Board	30	7	3¾	12	60	..	1820	many	Clements and Brady, of Dublin
Dalkey, Sandy Cove	.	,,	29	9	3¾	12	..	30	1818	many	,, ,,
Arklow	54		..	..	..	..	..	..	..	..	
Courtown	..		..	..	..	..	..	..	..	..	
Wexford	52		..	..	..	..	..	..	..	..	
Blackwater	..		..	..	..	..	..	..	..	..	
Rosslare Point	..	National Shipwreck Institution	26¼	6⅓	2½	5	70	20	..	..	On Mr. Palmer's plan
Carnsore	..		..	..	..	..	..	..	..	..	

around the Coast of the United Kingdom—*continued*.

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved.	
	lbs.					lbs.		
..	..	..	..	..	..	..	..	In good repair.
..	..	..	..	..	..	..	..	A life-boat has been suggested here. Three wrecks occurred last winter.
..	..	..	..	..	..	..	..	A life-boat required at Porthcawl for wrecks on Skerweather.
..	..	..	..	..	..	..	..	Has not been used; unserviceable.
8	12	C	..	..	..	..	..	Life-boat suggested here by Harbour-master. The Fishermen's Benevolent Society propose to establish a life-boat here forthwith.
..	..	..	..	..	..	..	..	Life-boat stationed here in 1835 was broken up in 1843.
..	..	..	..	..	1	24	3	In one wreck three lives were saved by mortar, and four lost. All might probably have been saved by good rockets. Mortar line has broken three times. The Fishermen's Benevolent Society propose to establish a life-boat here forthwith.
..	..	..	..	..	1	24	..	Wrecks are frequent in St. Bride's Bay.
..	..	..	..	..	..	..	..	Mortar supplied in 1846. The hide thongs of the shot commonly break.
9	9	D	1847	..	..	..	..	In good repair; safe, and pulls well.
..	..	..	..	..	..	..	..	In good repair. In a boat-house close to high-water mark, in an advanced position, in Cardigan Bay. A slight breakwater required to shelter the boat while launching.
..	..	..	..	..	..	..	..	A life-boat wanted here.
..	..	..	..	..	..	..	..	On a carriage in a boat-house near the sea; in charge of Harbour-master.
..	..	..	..	..	..	..	..	About one mile from the harbour's mouth; in charge of Harbour-master.
..	..	..	..	..	..	..	..	On the quay, in charge of Harbour-master. Unserviceable; not worth repair.
..	..	..	..	..	..	..	..	In charge of the Rev. John Owen, Llanbedrog, Pwllheli. Has upset. Not considered safe. There are frequent wrecks in St. Tudwall's Road.
..	..	..	..	..	..	..	..	Placed, in consequence of the wrecks in Carnarvon Bay, on the 13th January, 1843.
..	..	..	..	..	..	..	..	In charge of Mr. J. Jackson.
..	..	..	..	..	..	..	..	In charge of the Rev. O. G. Williams.
..	..	..	..	..	..	..	..	Kept in a boat-house close to high-water mark. In charge of the Rev. John Williams.
..	..	..	..	..	..	..	..	Kept in boat-house at pier-head. In charge of Mr. Lascelles.
..	..	..	..	..	..	..	..	In a boat-house close to high-water mark. In charge of the Rev. James Williams.
..	..	..	..	..	..	..	..	In charge of the Rev. Hugh Jones.
..	..	..	..	..	..	..	..	A life-boat is to be stationed here forthwith by the Fishermen's Benevolent Society.
..	..	..	..	..	..	..	..	The nine Liverpool life-boats, placed at five stations, are under the superintendence of Lieut. Lord, R.N., Harbour Surveyor. They have assisted 269 vessels during the last 11 years, and brought on shore 1,128 persons.
12	9	D	1839	..	..	..	..	A set of rockets is also kept at Leasowes Castle, Sir Edw. Cust, Bart.
..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	One mile west of Point of Ayr Light-house.
..	..	..	..	..	..	..	..	Under charge of Lieut. Kellock, R.N., Harbour-master at Southport.
..	..	..	..	..	..	..	..	Several wrecks here. A life-boat suggested at north entrance of the Ribble.
8	6	C	..	..	..	..	..	
8	6	C	..	..	..	..	..	
..	..	..	..	..	..	..	..	In boat-house on west pier.
..	..	..	..	..	..	..	..	Near Douglas Pier. Wrecks are of frequent occurrence in the Isle of Man. Life-boat unserviceable.
..	..	..	..	..	..	..	..	Wrecked at upper end of harbour. Unserviceable.
..	..	..	..	..	..	..	..	In a shed near the boat-house. Unserviceable.

IRELAND.

..	..	..	..	..	..	..	..	11 Coast Guard stations.
..	..	..	..	..	..	..	..	A life-boat might be useful here.
..	..	..	..	..	..	..	..	The Coast Guard gig has saved 13 lives. A life-boat would be useful.
..	..	..	..	..	..	..	..	10 Coast Guard stations. Wrecks are frequent in Belfast Lough.
..	..	..	..	..	..	..	..	10 Coast Guard stations. Wrecks not unfrequent.
..	..	..	..	..	..	..	..	Wrecks are frequent. Life-boat recommended here, or at Cloughy, 10 miles to the south.
..	..	..	..	..	..	..	..	Four Coast Guard stations.
..	..	..	..	..	..	..	..	Five Coast Guard stations.
..	..	..	..	..	..	..	..	Rockets recommended here and at Killough.
..	..	..	..	..	..	..	..	Rockets and life-boat recommended here. Wrecks of frequent occurrence previous to the placing of St. John's Light in 1844.
..	..	..	..	..	.	..	..	This boat is not considered safe: said to have drowned a crew at Kingstown. Crew of *Ida* lost in December, 1847, from want of rockets.
12	9	D	1839	..	..	..	..	A life-boat recommended here, or at the best point in Dundrum Bay.
..	..	..	..	..	..	..	..	Rockets recommended here. Dundrum Bay is, or was, notorious for its wrecks.
..	..	..	..	..	..	..	..	Rockets recommended here and at Leestone.
..	..	..	..	..	..	..	..	Four Coast Guard stations.
6	9	D	1846	..	..	..	..	Percussion lock for firing rockets recommended in preference to flint and hammer.
..	..	..	..	..	..	..	..	Five Coast Guard stations.
..	..	..	..	..	..	..	..	Three wrecks occurred here in 1848. Mortar recommended.
..	..	..	..	..	..	..	..	Nine Coast Guard stations.
7	9	D	1847	..	..	..	..	
12	9	D	1848	..	..	..	..	Mortar lines have frequently broken. Mortars returned to Ordnance.
16	9	D	1843	..	..	..	..	Rocket lines have broken.
..	..	..	..	..	..	..	..	In fair repair, but a heavy boat: kept on Howth East Pier, near a crane.
..	..	..	..	..	..	..	..	Five Coast Guard stations.
..	..	..	..	..	..	..	..	At entrance of the River Liffey; kept on the quay, near a crane.
..	..	..	..	..	..	..	..	On a carriage under a shed; in charge of Lieut. Hutchison, R.N., Harbour-master at Kingstown.
11	9	D	1839	..	..	..	..	Eight Coast Guard stations.
..	..	..	..	..	..	..	..	Rockets recommended here.
..	..	..	..	..	..	..	..	Seven Coast Guard stations.
..	..	..	..	..	..	..	..	Six wrecks took place on the Blackwater Bank in 1850.
10	3	D	1843	..	..	..	..	Life-boat pulls and sails fairly; in fair repair. Rockets too small.
9	3	D	1839	15	..	..	..	The inspecting commander states that a life-boat is much needed here. Wrecks are frequent. The rockets are too small to range any distance.

List of the Life-Boats, Life Rockets, and Mortars, placed

IRELAND.

Stations.	Distance from last Station.	By what Funds Placed and Supported.	Life-Boats.								Name of Builder.
			Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
Kilmore	..	National Shipwreck Institution.	28	6	2¾	6	73	..	1847	..	On Mr. Palmer's plan
Waterford	45		..	..	..	..	..	..	..	..	
Islands of Kane	..		..	..	..	..	..	..	..	..	
Youghal	76	Local subscription	26½	5¾	2½	6	76	20	1839	4	Taylor, of Limehouse, after Palmer.
Ardmore	..		..	..	..	..	..	..	..	..	
Ballycotton	..		..	..	..	..	..	..	..	..	
Queenstown—Cork	40		..	..	..	..	..	..	..	..	
Roche's Point Lighthouse	..		..	..	..	..	..	..	..	..	
Robert's Cove	..		..	..	..	..	..	..	..	..	
Kinsale	55		..	..	..	..	..	..	..	..	
Upper Cove	..		..	..	..	..	..	..	..	..	
Barry's Cove	..		..	..	..	..	..	..	..	..	
Dunny Cove	..		..	..	..	..	..	..	..	..	
Oyster Haven	..		..	..	..	..	..	..	..	..	
Courtmacsherry	..	National Shipwreck Institution	..	..	..	..	..	..	1825	..	On Mr. Palmer's plan
Dick Cove	..		..	..	..	..	..	..	..	..	
Skibbereen	60		..	..	..	..	..	..	..	..	
Milk Cove	..		..	..	..	..	..	..	..	..	
Glandore	..		..	..	..	..	..	..	..	..	
Castletownsend	..		..	..	..	..	..	..	..	..	
Crookhaven	..		..	..	..	..	..	..	..	..	
Skull	..		..	..	..	..	..	..	..	..	
Whitehorse	50		..	..	..	..	..	..	..	..	
Dunmanus	..		..	..	..	..	..	..	..	..	
Castletown	83		..	..	..	..	..	..	..	..	
West Cove—Derrynane	13	National Shipwreck Institution	26	6¾	3½	6	75	20	1825	..	On Mr. Palmer's plan
Knightstown—Valencia	65		..	..	..	..	..	..	..	..	
Ballinskelligs	..		..	..	..	..	..	..	..	..	
Dingle	141		..	..	..	..	..	..	..	..	
Ballyheigne	40		..	..	..	..	..	..	..	..	
Kilrush—Shannon	60		..	..	..	..	..	..	..	..	
Seafield	60		..	..	..	..	..	..	..	..	
Galway	150		..	..	..	..	..	..	..	..	
Clifden	..		..	..	..	..	..	..	..	..	
Westport	..		..	..	..	..	..	..	..	..	
Keele	..		..	..	..	..	..	..	..	..	
Belmullet	70		..	..	..	..	..	..	..	..	
Dunkeehan	20		..	..	..	..	..	..	..	..	
Ballycastle—Killala	..		..	..	..	..	..	..	..	..	
Pulendiva	45		..	..	..	..	..	..	..	..	
Mullaghmore—Sligo	50		..	..	..	..	..	..	..	..	
Killibegs	50		..	..	..	..	..	..	..	..	
Lochrus	40		..	..	..	..	..	..	..	..	
Rutland	40		..	..	..	..	..	..	..	..	
Sheephaven	19		..	..	..	..	..	..	..	..	
Rathmullen	30		..	..	..	..	..	..	..	..	
Carne	42		..	..	..	..	..	..	..	..	
Greencastle	52		..	..	..	..	..	..	..	..	

around the Coast of the United Kingdom—*continued*.

IRELAND.

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved	
	lbs.					lbs.		
12	3	D	1846	23	..	..	..	Wrecks frequent. Life-boat in fair repair; in a boat-house, close to high-water mark, in charge of Coast Guard.
..	..	..	..	..	..	..	..	Six Coast Guard stations.
12	9	D	1839	..	..	..	..	Six out of ten rockets have burst, considered to be from bad charging.
10	9	D	1839	..	..	..	..	Five Coast Guard stations. Life-boat out of repair; on a carriage. One rocket line, supplied in 1839, broke three times on being tested; another, supplied in 1849, broke five times.
..	..	..	..	..	..	..	..	Good rockets are recommended here.
..	..	..	..	..	..	..	..	Sixty-seven lives have been lost here within the last 15 years. A life-boat is much wanted, and could readily be manned. Rockets, too, are required. It is 12 miles S.W. of Youghal.
..	..	..	..	..	..	...	..	Seven Coast Guard Stations.
23	9	D	1846	..	..	..	..	
..	..	..	..	..	..	..	..	Rockets recommended here.
..	..	..	..	..	..	..	..	Eight Coast Guard Stations.
7	9	D	1838	..	..	..	..	Several rockets have burst, and the rocket lines have broken several times. Lent to How Strand.
16	9	D	1846	6	..	..	..	The rocket lines should be tested before being sent to the station.
12	9	D	1850	..	..	..	..	Wrecks of frequent occurrence.
12	9	D	1846	..	..	..	..	Rockets recommended here, and at Old Head and How Strand. *Severn* wrecked at How Strand in 1848.
7	9	D	1844	..	..	..	..	This life-boat was transferred to Kerry in 1828, and is now at Derrynane Abbey, in charge of M. O'Connell, Esq., M.P.
..	..	..	..	..	..	..	..	Wrecks frequent. A life-boat recommended here, and rockets.
..	..	..	..	..	..	..	..	Seven Coast Guard stations.
12	6	D	1843	..	..	..	..	
12	9	D	1840	..	..	..	..	
6	9	D	1840	..	..	..	..	When tried, the rocket line broke.
16	6	D	..	..	..	..	..	
..	..	..	..	..	..	..	..	A life-boat might be useful here.
..	..	..	..	..	..	..	..	Two Coast Guard stations.
6	9	D	..	..	..	..	..	
..	..	..	..	..	..	..	..	Three Coast Guard stations, and several detachments.
..	..	..	..	..	..	..	..	In charge of M. O'Connell, Esq., M.P., at Derrynane Abbey, seven miles west of Westcove. In good repair.
..	..	..	..	..	..	..	..	Three Coast Guard stations. All the crew of the brig *William* lost in 1847 in entering Valencia Harbour.
..	..	..	..	..	..	..	..	The whole crew of the French brig *Camellia* lost in 1847, and several of the bark *Benin* in 1848. Rockets recommended.
..	..	..	..	..	..	..	..	Eight Coast Guard stations.
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Six ,, ,,
..	..	..	..	..	..	..	..	Two ,, ,,
..	..	..	..	..	..	..	..	Seven Coast Guard stations. Neither life-boats, rockets, nor mortars at any of these stations; and wrecks, it is said, are not frequent.
..	..	..	..	..	..	..	..	Four Coast Guard Stations.
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Six ,, ,,
..	..	..	..	..	..	..	..	Two ,, ,,
..	..	..	..	..	..	..	..	Four ,, ,,
..	..	..	..	..	..	..	..	Four ,, ,,
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Five ,, ,,
..	..	..	..	..	..	..	..	Two ,, ,,
..	..	..	..	..	..	..	..	Two ,, ,,
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Three ,, ,,
..	..	..	..	..	..	..	..	Two ,, ,,

List of the Life-Boats, Life-Rockets, and Mortars, placed

SCOTLAND.

Stations.	Distance from last Station.	By what Funds Placed and Supported.	Life-Boats.								Name of Builder.
			Length.	Breadth.	Depth.	Number of Oars.	Cost.	Weight.	Year Built.	Number of Lives Saved.	
	M.		Ft.	Ft.	Ft.		£.	Cwt.			
Dunbar	..	..	..	..	..	..	..	..	1808	..	..
Redheugh	..	..	..	..	..	..	..	..	..	..	..
Elie	..	..	..	..	..	..	..	..	..	..	..
St. Andrews	..	Private subscription	7	9¾	3¾	10	120	..	1824	many	, Newcastle
Boarhills	..	..	..	..	..	..	..	..	..	..	..
Westhaven	..	Private	30	9	..	12	..	..	..	..	..
Uzon	..	..	..	..	..	..	..	..	..	..	..
Johnshaven	..	..	..	..	..	..	..	..	..	..	..
Montrose	..	Tax on vessels entering	25	8¼	3¼	8	100	..	1834	30	W. Wake, Sunderland
Auchmithie	..	..	..	..	..	..	..	..	..	..	..
Arbroath	..	..	25	9	3	12	130	..	1803	2	Newcastle
Buddonness Light-Tay, Broughty Ferry.	..	Tax on vessels entering the Tay	30	9¾	3¼	12	130	..	1830	27	Robson, South Shields
Cove Bay	..	..	..	..	..	..	..	..	..	..	..
Aberdeen Pier	..	Harbour Commissioners	26	9	3½	8	100	20	1843	43	, Sunderland
Collieston	..	..	..	..	..	..	..	..	..	..	..
Peterhead	..	..	..	..	..	..	..	..	..	..	..
Frazerburgh	..	Private	..	..	..	..	..	..	..	..	..
Banff	..	..	..	..	..	..	..	..	..	..	..
Portsoy	..	..	..	..	..	..	..	..	..	..	..
Buckie	..	..	..	..	..	..	..	..	..	..	..
Wick	..	British Fishery Society	28	10½	3½	12	169	30	1848	..	Ed. Oliver, South Shields
Irvine	..	..	26	7¾	2½	10	..	..	..	..	..
Ardrossan	..	..	26½	7½	2¾	10	..	..	..	..	..
Port Logan, Wigtonshire	..	..	..	..	..	..	..	..	..	..	..

around the Coast of the United Kingdom—*continued.*

SCOTLAND.

Rockets.					Mortars.			Remarks, &c.
Number.	Size.	By whom made.	When Supplied.	Lives Saved.	Number.	Size.	Lives Saved.	
	lbs.					lbs.		
..	..	..	..	..	1 1	24 6	10	Saved, in December 1810, 45 men, in two cargoes, from H.M.S. *Pallas*, lost on rocks to eastward of Vault Point. In making third trip upset, and drowned nearly all. Sold. Since 1832, 19 vessels have been wrecked on this station.
..	..	..	..	..	..	..	..	Local boats might be fitted. Rockets are required.
..	..	..	..	..	..	..	..	Rockets required here.
..	..	..	..	..	..	..	..	In good repair; pulls well.
..	..	..	..	..	..	..	..	Life-boat required here.
..	..	..	..	..	..	..	..	Rockets wanted here.
5	8	D	1845	..	..	..	..	In good repair; safe.
11	8	D	1845	..	..	..	..	
..	..	..	..	..	1	24	..	
..	..	..	..	..	..	..	..	Rockets much required here.
..	..	..	..	..	..	..	..	Useless from her weight; another required.
1	8	D	1845	..	..	..	..	In fair repair and safe, but pulls heavily. Supplied by the Dundee Humane Society.
..	..	..	..	..	1	6	..	
13	9	D	1836	..	1	24	9	
..	..	..	..	..	1 1	24 6	..	
set	6	D	1840	7	1 1	24 6	27	
12	9	D	..	..	..	..	..	
12	12	D	1848	..	1 1	24 6	16	
..	..	..	..	..	1 1	24 6	6	
..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	In good repair, and has a carriage.
..	..	..	..	..	..	..	..	Out of repair.
..	..	..	..	..	..	..	..	Old and useless.
..	..	..	..	..	1 1	24 6	6	

ROYAL NATIONAL INSTITUTION FOR THE PRESERVATION OF LIFE FROM SHIPWRECK.

Established in 1824. Supported by Voluntary Contributions.

Patroness.

HER MOST GRACIOUS MAJESTY THE QUEEN.

Vice-Patrons.

HIS ROYAL HIGHNESS THE PRINCE ALBERT, K.G.
HIS MAJESTY THE KING OF THE BELGIANS, K.G.

President.

Rear-Admiral His Grace ALGERNON DUKE OF NORTHUMBERLAND, F.R.S.

Vice-Presidents.

His Grace the Archbishop of Canterbury.
The Most Hon. the Marquess of Lansdowne, K.G.
The Most Hon. the Marquess of Anglesey, K.G., G.C.B.
Capt. the Right Hon. Earl Spencer, R.N., K.G., C.B.
Capt. the Right Hon. Earl Talbot, R.N., C.B.
The Right Hon. Earl Manvers.
The Right Hon. Earl Brownlow, G.C.H.
The Right Hon. Earl Amherst.
The Right Hon. Earl of Ripon.
The Right Rev. the Lord Bishop of London.
The Right Rev. the Lord Bishop of Lincoln.
The Right Hon. Lord Braybrook.
The Right Hon. Lord John Russell, M.P.
Sir Augustus Wm. Hillary, Bart., G.C.J.J.
The Deputy Master of the Trinity House.
Joshua Walker, Esq.
Joshua Watson, Esq.
Thomas Wilson, Esq.

Committee of Management.

Thomas Wilson, Esq., Chairman.

George Palmer, Esq., Deputy Chairman.

Rear-Admiral Bowles, C.B., M.P.
Henry Blanshard, Esq.
James Cazenove, Esq.
Lieut. Colonel Colquhoun, R.A., F.R.S., Carriage Department, Royal Arsenal, Woolwich.
William Cotton, Esq.
Capt. George Davies, R.N.
John Deacon, Esq.
Rear-Admiral Deans Dundas, C.B., M.P.
Capt. Stephenson Ellerby, Elder Brother of the Trinity House.
Lieut. F. W. Ellis, R.N., Chairman of the Southwold Life-Boat Committee.
Commodore Sir Thomas Herbert, R.N., K.C.B.
Sir Augustus Wm. Hillary, Bart.
Edward Hurry, Esq.
Commander E. A. Inglefield, R.N.
Commander A. Jerningham, R.N.
George Lyall, Esq.
W. S. Marshall, Esq.
James Peake, Esq., Assistant-Master Shipwright in Her Majesty's Dockyard, Woolwich.
Capt. Lambert Perrott.
J. D. Powles, Esq.
Capt. C. R. Preston.
Capt. R. Saumarez, R.N., K.L.
Capt. S. Sparshott, R.N.
Mr. Alderman Thompson, M.P.
Capt. Sir B. W. Walker, R.N., K.C.B., Surveyor of the Navy.
Capt. Washington, R.N., F.R.S.
Isaac Watts, Esq., Assistant Surveyor of the Navy.
Francis Wilson, Esq.
H. S. H. Wollaston, Esq.

Trustees.

Thomas Wilson, Esq.
George Palmer, Esq.
Wm. Skinner Marshall, Esq.
John Diston Powles, Esq.

Treasurer,—R. Percival, Esq. *Auditors*,—Mr. Alderman Thompson, M.P. T. A. Curtis, Esq.

Bankers,—Messrs. Willis, Percival, and Co., Lombard-street.

Secretary,—Mr. Richard Lewis.

LIST OF SUB-COMMITTEES.

Finance Sub-Committee.

Chairman,—Thomas Wilson, Esq., Jeffrey's-square.

Edward Hurry, Esq.
Capt. C. R. Preston.

Life-Boat Sub-Committee.

Chairman,—Commodore Sir Thomas Herbert, R.N., K.C.B., Cadogan-place.

Capt. Sir B. W. Walker, R.N., K.C.B.
George Palmer, Esq.
Isaac Watts, Esq.
Sir Augustus Wm. Hillary, Bart.
Capt. Washington, R.N., F.R.S.
James Peake, Esq.

Life-Boat Carriage, House, Rocket, and Mortar Sub-Committee.

Chairman,—Lieut.-Colonel Colquhoun, R.A., F.R.S., Royal Arsenal, Woolwich.

Capt. George Davies, R.N.
James Peake, Esq.
Capt. Jerningham, R.N.
Lieut. Ellis, R.N.

Wreck, Reward, and Medal Sub-Committee.

Chairman,—Capt. Stephenson Ellerby, Trinity House.

Capt. Sparshott, R.N.
Edward Hurry, Esq.
Capt. Inglefield, R.N.
Capt. Lambert Perrott.

The Chairman of Committee is, *ex officio*, a Member of all Sub-Committees.

Capt. George Davies, R.N., Inspector of Life-Boats and of Life Apparatus.

OFFICE,—20, *John Street, Adelphi, London.*

Life-Boat Regulations.

The following Regulations are intended for guidance of the Local Committee to be formed at each place at which a life-boat is stationed by the National Shipwreck Institution, and to whose care and control the life-boat, her crew, and everything connected with her management and maintenance, will be intrusted.

The Local Committee to consist, if practicable, of not less than three persons usually resident—one of them to be a sailor. And with the view of facilitating the co-operation of the coast-guard with the Committee, it will be desirable that the Inspecting-Commander of the District, or in his absence the nearest coast-guard officer to the spot, should be *ex officio* a member of the Local Committee.

1. The life-boat crew to consist of a Coxswain-superintendent, second coxswain who is to be bowman, and as many boatmen in addition as the boat pull oars.

2. For every boat, at least double the number of men required (if they can be found at or near the spot) shall be enrolled and numbered. The first men on the list to form the permanent working boat's crew; the remainder to fill up vacancies and casual absences, in succession.

3. Such list to consist of sailors and fishermen who are usually resident, and (with permission of the Comptroller-General) of any coast-guard men of the station who may volunteer for the service. As a general rule, no man to be enrolled whose age exceeds 55 years.

4. The salary of the Coxswain-superintendent shall be 4*l.* a-year. On every occasion of going afloat to save life, all shall receive alike, 7*s.* a man; for every time of going afloat for exercise, 2*s.* 6*d.* each man. In the absence of the coxswain, the second coxswain will take charge of the boat, and the boatmen will be numbered, and take charge in order, from aft to forward.

5. In the event of money being received by the life-boat for salvage, or similar service, one-fifth of the whole shall be reserved towards the maintenance and repair of the boat, the remaining four-fifths shall be divided into shares of which the Coxswain shall be entitled to four shares, the second coxswain to three shares, and the boatmen to two shares each.

6. If local subscriptions be raised to reward any special act of gallantry or exertion, the Institution recommends that the whole of the money be paid to the crew, divided into shares and apportioned as above.

7. As at each life-boat station there will be a Local Committee, the coxswain will act under their immediate directions, and the boat, except in case of wreck, is never to be taken afloat without their sanction.

8. As the efficiency of a life-boat depends on the good training and discipline of her crew, the strictest attention must be paid by them to the directions of the coxswain on all occasions connected with the service. The boat shall be taken afloat for exercise, fully manned, at least once a quarter, giving the preference to blowing weather.

9. The Local Committee at each station is requested to make a Quarterly Report to the Institution, as to the behaviour of the boat during exercise, pointing out any defect that may require to be remedied, and offering any suggestion that may conduce to the efficiency of the service. Also generally to report on the state and condition of the boat, the carriage, the boat-house, and all the life-boat gear. Should occasion for immediate repairs arise, the Local Committee is authorized to make them to the extent of 5*l.*; more extensive repairs to be referred with an estimate to the Parent Institution.

10. The boat is to be kept on her carriage in the boat-house, with her gear in her ready for use, except matches, rockets, and perishable articles which may require to be secured from damp.

11. There are to be three keys to the boat-house, kept in different places, with the address of each painted on the door; one in possession of the Coxswain, and the others as the Local Committee may decide.

12. Immediately on intimation of a wreck, or of a vessel in distress, the Coxswain is to use his utmost exertions to assemble his crew, launch his boat, and proceed to her assistance; and in the event of any of his crew being absent, he is to select the best volunteers he can get on the spot, who shall be paid the same as the enrolled boatmen.

13. If a wreck occurs at some distance from the station, so as to require the boat to be transported along the coast, the Coxswain is to send to procure sufficient horses (which by the Wreck and Salvage Act, any magistrate, constable, or revenue officer, may demand the use of), attach them to the carriage, and lose no time in making the best of his way with the crew to the scene of wreck.

14. A reward of 7*s.* to be given to the man who first brings intelligence of a wreck at such a distance along the coast as not to be in sight from the coast-guard or other look out.

15. A signal shall be agreed on by which the life-boat crew can be called together when required. A flag hoisted at the watch-house is recommended by day, and the firing of the mortar (or other alarm signal) at the coast-guard station twice, quick, by night.

16. On approaching a wreck, the Coxswain will use his judgment, according to the circum-

stances of the case, whether he will board the wreck end on, either on the bow, on the quarter, or on the broadside; or whether he will go to windward, drop his anchor, and veer down to the wreck; or if he will lay her alongside. The greatest caution, however, is recommended in this latter case, and it is not to be resorted to when any other mode of boarding a wreck can be adopted.

17. On boarding wrecks, the preservation of life is to be the Coxswain's sole consideration, and he is on no account to take in any goods, merchandize, luggage, or other articles which may endanger the safety of his boat, and the lives of those intrusted to his charge. And should any be brought in contrary to his remonstrance, he is fully authorized to throw them overboard.

18. In the event of any men being brought ashore from a wreck, the Coxswain shall give immediate notice to the Local Agent (if any) of the Shipwrecked Fishermen and Mariners' Benevolent Society, in order that he may take the steps prescribed by the regulations of that Society for their relief, and for forwarding them to their respective destinations.

19. No one besides the crew, namely, the Coxswain, second coxswain, and one boatman for each oar, is on any account to be allowed to go out in the life-boat when going to a wreck, except with the express sanction of the Local Committee.

20. The life-boat is not to be used for taking off an anchor. Nor for the purpose of salvage, nor for taking off stores, a pilot, or orders to a ship, so as to interfere with private enterprize (except in cases of emergency, with the special sanction of the Local Committee), but to be reserved for aes involving risk of life.

21. The Coxswain is to see generally to the efficiency of the boat for service: when the weather appears threatening at sunset, he shall have the sand removed from the boat-house door, the wheels of the carriage greased, the ways (if any) ready for laying, a breaker of fresh water, hand-rockets, and all other gear placed in the boat ready for use at a minute's warning.

22. On the approach of winter, in exposed situations liable to wrecks, it is recommended that a mooring anchor with no upper flue (having a block attached, and a warp rove and buoyed), be laid out below low-water mark, opposite the boat-house (or more suitable situation), for hauling the boat off in case of need.

23. The Coxswain will enter in a journal according to the annexed form (with which he will be supplied), all services performed by his boat, stating the time of launching, time of reaching the wreck, the vessel's name, whither bound, number of persons rescued, &c., a copy of which, on each occasion of wreck, is to be forwarded, by the Local Committee, to the Secretary of the Institution in London.

24. The full Instructions of the Royal Humane Society for restoring suspended animation, to be posted in each boat-house; and a copy of the Abstract to be kept with the boat's small stores, and taken off in the boat, so as to be at all times at hand.

25. On returning from service, the boat is not to be left in the surf on the beach, but as soon as possible is to be got on her carriage, and placed in the boat-house. On the first fine day after use, the boat is to be drawn out to dry up any wet that may remain about her, and any damage is to be immediately made good.

26. The Coxswain will be held responsible for the efficiency and general good order of the boat-house, the boat, and her gear. And it is hoped that a sense of the importance of the trust confided to them in the cause of humanity will lead the Coxswain and crew to be most careful on these points, and to distinguish themselves by the readiness and seamanlike manner in which their boat is handled.

NORTHUMBERLAND, *Rear-Admiral,*
President.

Life-Boat Gear.

1. Anchor and cable; anchor for a 30 ft. boat, not less than 75 lbs. weight; cable 60 fathoms of 3½-inch rope. The anchor and cable to be secured to the floor of the boat amidships.
2. A grapnel 25 lbs. weight, and rope for letting go from the stern, to prevent the boat ranging ahead when at a wreck.
3. A spring for the cable in case of need. A boat's painter.
4. A norman, with forelock, to ship in the step of the boat's mast when in tow; or when riding at anchor.
5. A set of short fir oars complete, with lanyards; and a spare oar for each two the boat pulls.
6. A set of rope grummets and iron thole pins (with forelocks), and with half the number of each, spare.
7. Two steering sweep-oars; three boat-hooks, with lanyards.
8. A hand grapnel, with heaving line.
9. A *sharp* axe secured under the main thwart; and a small *sharp* hatchet at each end of the boat.
10. Two life-buoys with lines attached; short-knotted life-lines to hang over the side at each thwart.
11. Boat binnacle and compass; lamp *kept trimmed;* oil-can; matches *to be kept dry*
12. Spy-glass; lantern; fisherman's white light, or port-fire.
13. Hand-rockets for throwing a line on board a wreck.
14. Boat's hand-lead and line for sounding in case of fog.
15. Hammer, nails, chisel, marline-spike, grease, oakum, sheet-lead, &c.
16. A cork life-belt for each of the crew.
17. A breaker of fresh water, and biggin.
18. Boat's carriage, luff-tackle, handspikes, &c.
19. A chest for small stores in the boat-house.
20. Masts, sails, gear, and rudder, when required.

The Coxswain-Superintendent to keep a list of the stores, which are to be examined every month by the Local Committee, in order to their being repaired, or replaced with new if in the least degree doubtful.

Royal National Shipwreck Institution,
20, *John-street, Adelphi, London,* 1*st July,* 1851.

Form of Return of Wreck and Services of Life-Boat at _____.

1. Name of vessel, and where belonging to?
2. Name of master, and of owners?
3. Rig, tonnage, number of crew?
4. Where from? Where bound to?
5. What cargo? or in ballast?
6. Wind and weather?
7. Time of day? State of tide?
8. Exact spot where wrecked?
9. Number of lives saved?
10. Number of lives lost?
11. Supposed cause of wreck?
12. Remarks, &c.

13. Time of launching life-boat?
14. Time of reaching wreck? Time of returning ashore?
15. Did the boat behave well?
16. Was any damage done? Are any repairs required?
17. Names of men employed, and number of times they have been off in the life-boat to a wreck; noting any special case of exertion.
18. Amount, if any, of salvage?
19. Remarks, &c.

(Signed)

Coxswain-Superintendent.

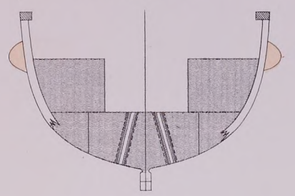
Dated,

LONDON:
Printed by W. Clowes & Sons, Stamford Street and Charing Cross.

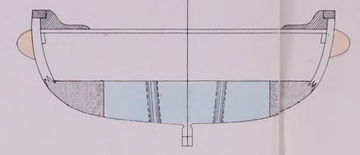
LIFE BOAT, BY JAMES BEECHING, Gt. YARMOUTH.

Submitted to compete for the Northumberland Premium.

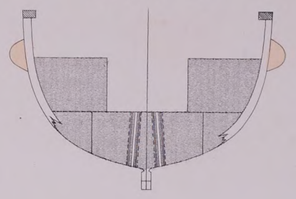
Section at 3.



Section at 8.

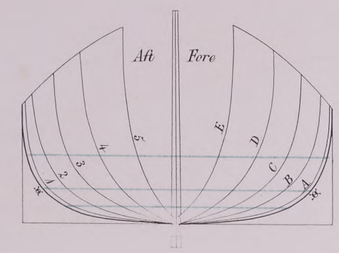


Section at C.

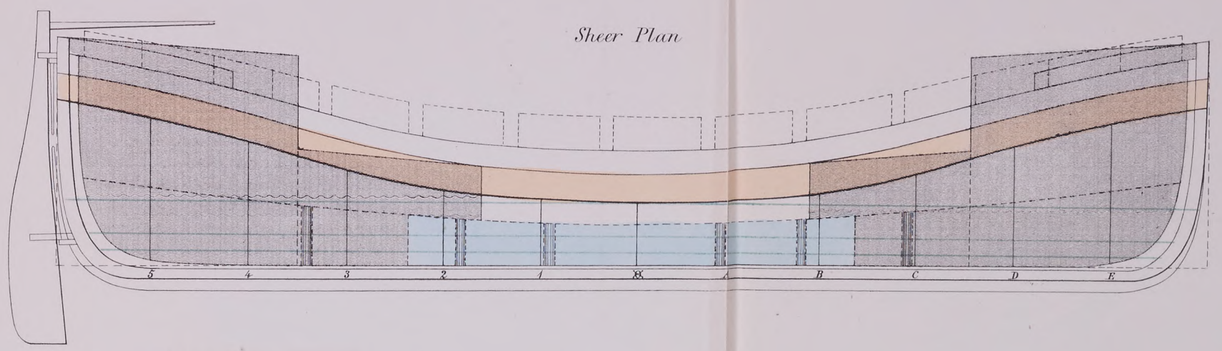


Air.
Water.
Cork.

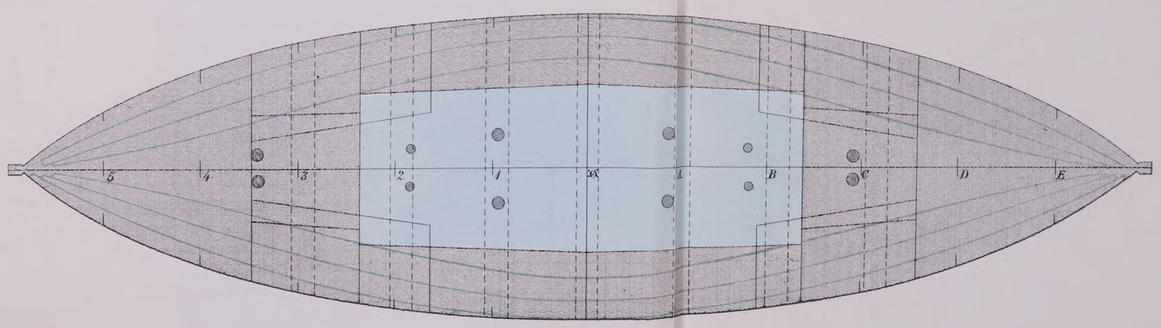
Body Plan.



Sheer Plan



Plan.



PRINCIPAL DIMENSIONS.

Length extreme	36 ft. 0 ins.
Length of Keel	31 , 0 ,
Breadth of Beam	9 , 6 ,
Depth	3 , 6 ,
Sheer of Gunwale	3 , 0 ,
Extra Buoyancy Air 300 cubic ft.	8½ tons
Internal capacity up to the level of the thwarts	5
Area of delivering tubes	276 Sq. ins
Proportion of delivering area to capacity	1 to 64
Weight of Boat or displacement	3¼ tons
Ballast 2 tons of Water & iron keel ¼ ton	2¼ ,
Draught of Water with 30 men on board	2 ft. 2 ins.
No. of Oars double banked	12
Clench built of Oak & iron fastened	
Rig of Boat	2 lug sails
Cost complete	£ 250

30 25 20 15 10 5 4 3 2 1 0 Scale 1 Inch to a Feet

Drawn by Joseph Prowse of H.M. Dockyard, Woolwich, 1851.

Standidge & Co. Lithe Old Jewry

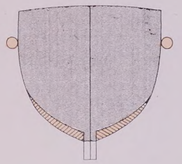
LIFE BOAT, BY HENRY HINKS, APPLEDORE, DEVON.

Submitted to compete for the Northumberland Premium.

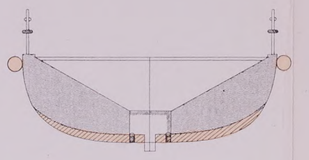
Air.

Cork.

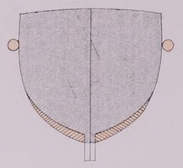
Section at 3.



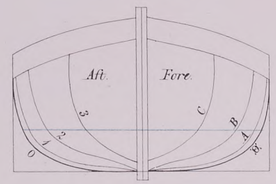
Section at B.



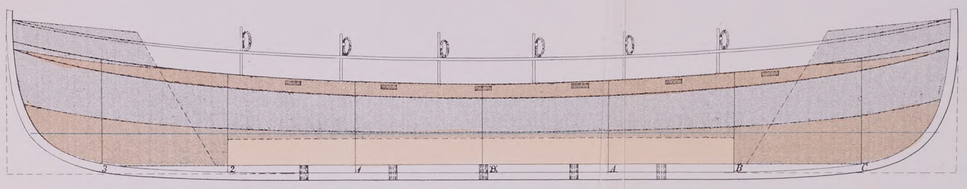
Section at C.



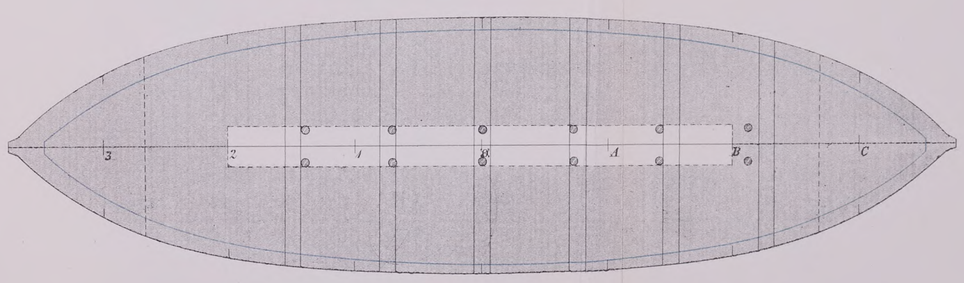
Body Plan.



Sheer Plan.



Plan.



30 25 20 15 10 5 4 3 2 1 0 *Scale ¼ inch to a foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*30 ft. 0 ins.*
Length of Keel	*27 " 0 "*
Breadth of Beam	*9 " 0 "*
Depth	*3 " 0 "*
Sheer of Gunwale	*2 " 0 "*
Extra buoyancy, Cork & Air, 105 cubic ft. equal to	*3 tons*
Internal capacity up to the level of the thwarts	*3½ "*
Area of delivering tubes	*72 sq. ins.*
Proportion of delivering area to capacity	*1 to 1.6*
Weight of Boat or displacement	*35 Cwt.*
Ballast	*none*
Draft of Water with 30 men on board	*18 ins.*
N° of Oars, double banked	*12 oars.*
Clench built & copper fastened	
Rig of Boat	
Cost complete	*£ 110*

Drawn by Joseph Prowse, of H.M. Dockyard, Woolwich, 1851.

Standidge & C°, Litho. Old Jewry.

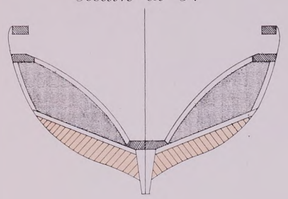
LIFE BOAT, BY J. & E. PELLEW PLENTY, NEWBURY, BERKS.

Submitted to compete for the Northumberland Premium.

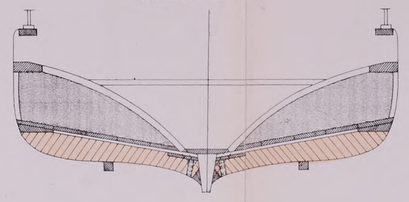
Cork.

Air.

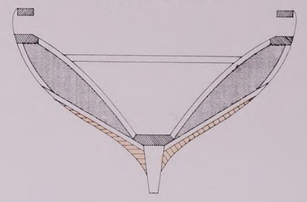
Section at 5.



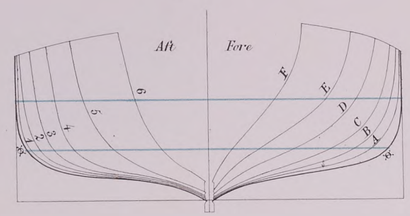
Section at 6.



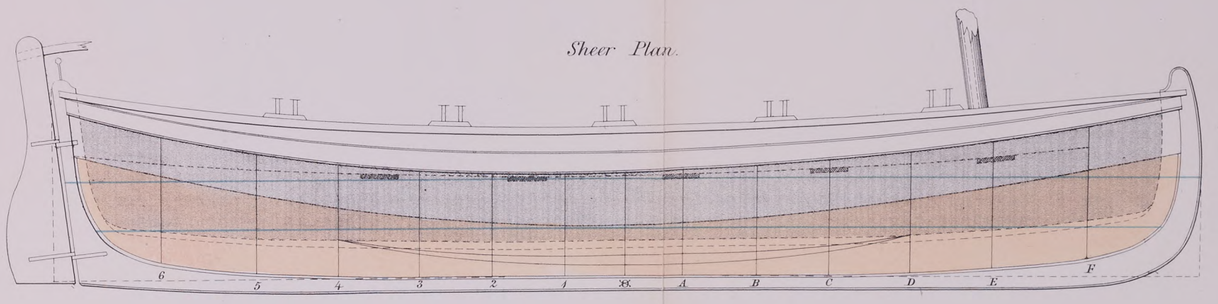
Section at E.



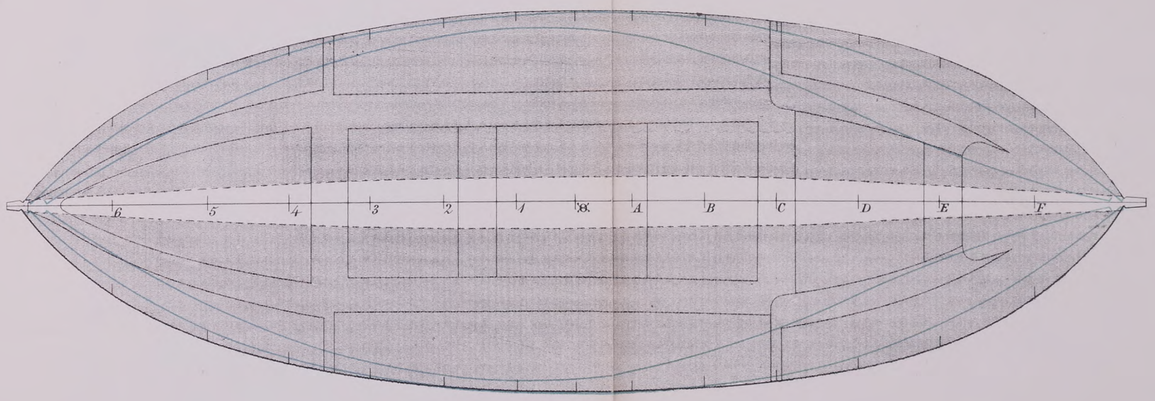
Body Plan.



Sheer Plan.



Plan.



20 15 10 5 4 3 2 1 0 Scale $\frac{3}{8}$ Inch to a Foot

PRINCIPAL DIMENSIONS.

Length extreme	24 ft. 0 ins
Length of Keel	23 " 0 "
Breadth of Beam	8 " 0 "
Depth	2 " 10 "
Sheer of Gunwale	1 " 2 "
Extra buoyancy, Cork & Air, 82 cubic ft. =	$2\frac{1}{3}$ tons
Internal capacity up to the level of the thwarts	$1\frac{1}{2}$ "
Area of delivering valves	24 sq ins
Proportion of delivering area to capacity	1 to 2·3
Waight of Boat or displacement	30 cwt.
Draft of Water with 30 men on board	1 ft. 4 ins
N° of Oars, double banked	8
Clench built of Oak & Arbeal & copper fastened	
Rig of Boat	1 lug sail
Cost complete	£ 150

Drawn by Joseph Prowse, of H. M. Dockyard, Woolwich, 1851

Standidge & Co. Litho. Old Jewry

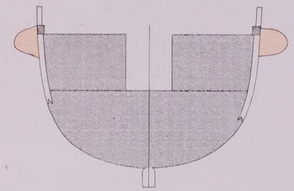
LIFE BOAT, BY WILLIAM TEASDEL, Gt YARMOUTH.

Submitted to compete for the Northumberland Premium

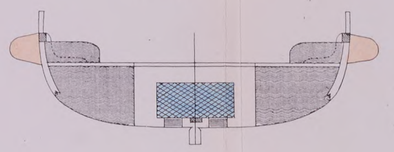
Air.

Cork.

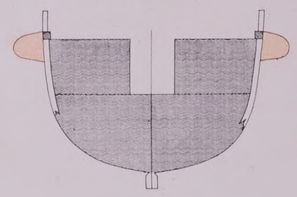
Section at 3.



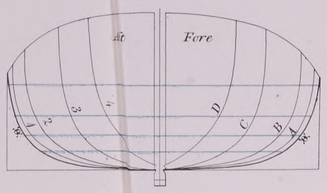
Section at B.



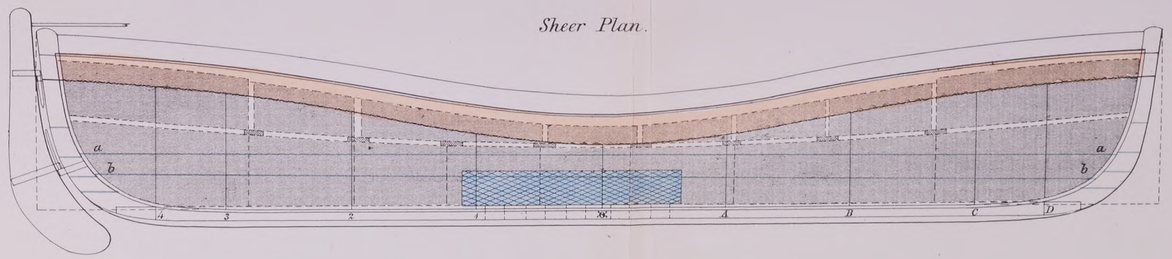
Section at C.



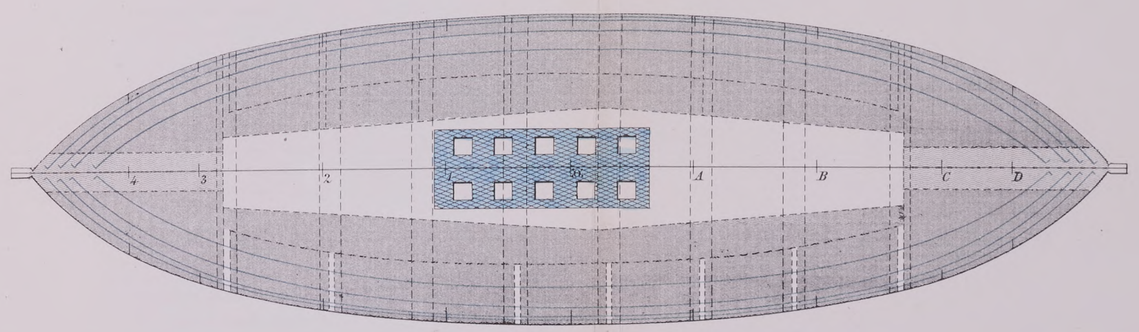
Body Plan.



Sheer Plan.



Plan.



30 25 20 15 10 5 4 3 2 1 0 Scale ¼ Inch to the Foot

PRINCIPAL DIMENSIONS.

Length extreme	36 ft. 0 ins.
Length of Keel	32 . 0
Breadth of Beam	10 . 6
Depth	3 . 4
Sheer of Gunwale	0 . 24
Extra Buoyancy Air & Cork 308 cubic ft equal to 9 Tons.	
Internal capacity up to the level of the thwarts	5½ .
Area of delivering valves	600 sq. ins.
Proportion of delivering area to capacity	1 to 32
Weight or displacement	4½ tons.
Ballast, iron keel 7 cwt. metal valves 4 cwt. Total	11 cwt.
Draught of Water with 30 men	1 ft. 10 ins.
No of Oars double banked	12
Clench built of English Oak & galvanized iron fastened	
Rig of Boat, 3 Lug Sails	
Cost complete	£ 200

Drawn by Joseph Prowse of H.M. Dockyard, Woolwich, 1851.

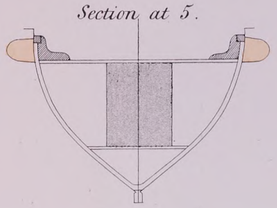
Standidge & Co. Lithe Old Jewry.

LIFE BOAT, BY HARVEY & SON, IPSWICH.

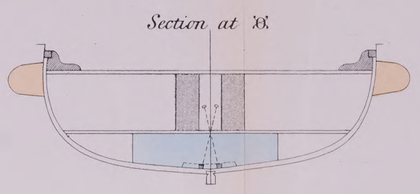
Submitted to compete for the Northumberland Premium.

Air.
Water.
Cork.

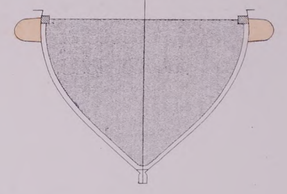
Section at 5.



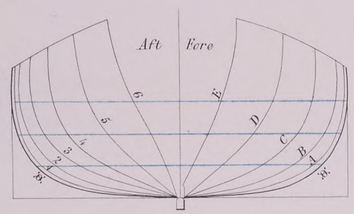
Section at 8.



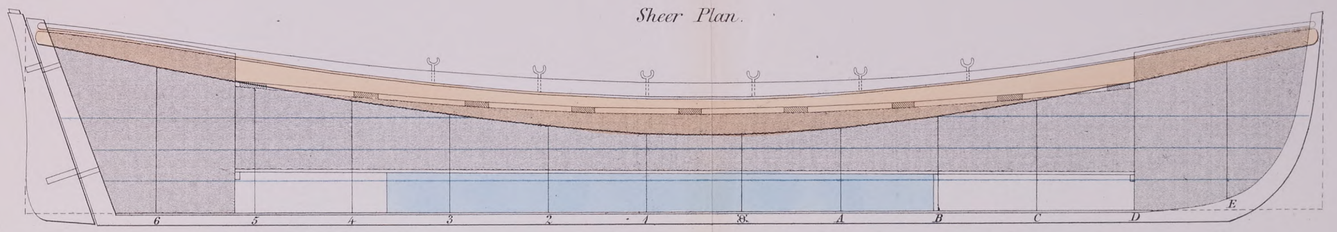
Section at D.



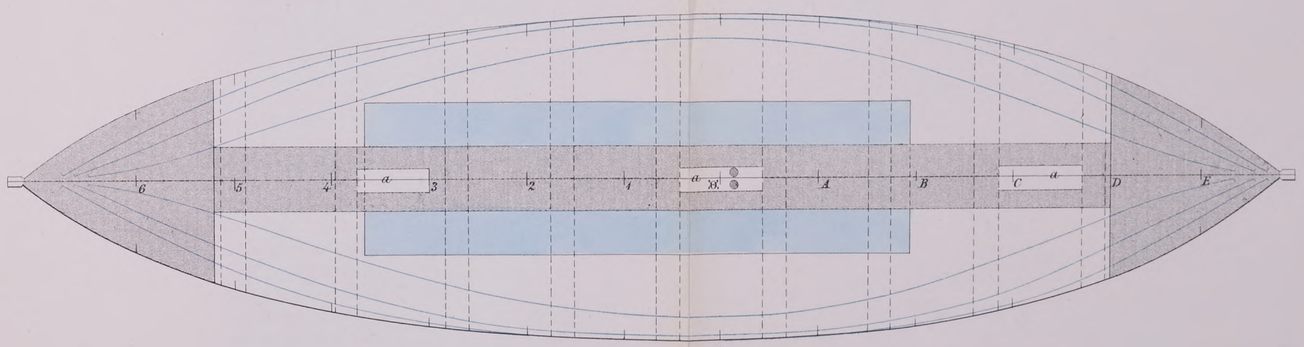
Body Plan.



Sheer Plan.



Plan.



30 25 20 15 10 5 0 *Scale ¾ Inch to a Foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*41 ft. 0 ins.*
Length of Keel	*36 , 0 ,*
Breadth of Beam	*11 , 0 ,*
Depth	*4 , 0 ,*
Sheer of Gunwale	*0 , 2½*
Effective extra Buoyancy, Air 200 cubic ft. equal to 6 tons	
Internal capacity up to the level of the thwarts	*40½*
Area of delivering valves	*140 sq. ins.*
Proportion of delivering area to capacity	*1 to 2·62*
Weight or displacement	*45 cwt.*
Ballast, Water	*2¼ tons*
Draught of Water with 13 men	*18 ins.*
№ of Oars double banked	*12 ,*
Clench built of Baltic Oak & iron fastened	
Rig of Boat	
Cost complete	*£ 200*

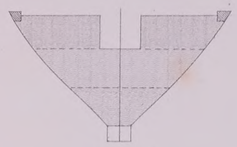
Drawn by Joseph Prewse of H.M. Dockyard, Woolwich, 1851.

Standidge & Co. Lithe Old Jewry.

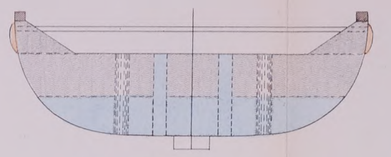
LIFE BOAT, BY GEORGE FARROW, SOUTH SHIELDS.

Submitted to compete for the Northumberland Premium.

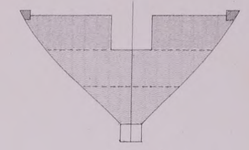
Section at 3.

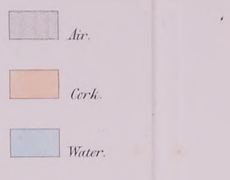


Section at 'B.

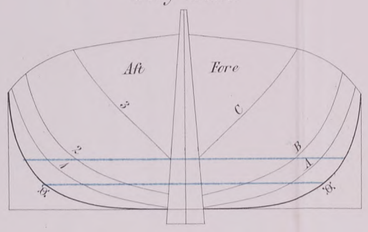


Section at C.

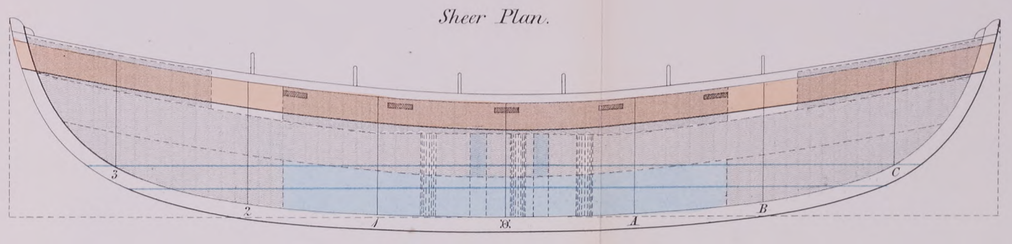




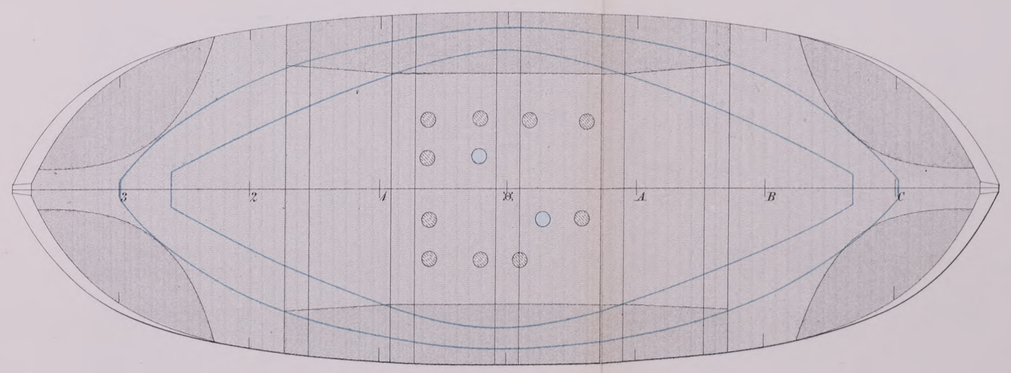
Body Plan.



Sheer Plan.

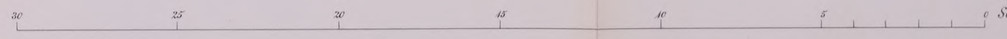


Plan.



PRINCIPAL DIMENSIONS.

Length extreme	*30 ft. 0 ins.*
Length of Keel	*46 , 0 ,*
Breadth of Beam	*10 , 0 ,*
Depth	*3 , 9 ,*
Sheer of Gunwale	*2 , 6 ,*
Effective extra buoyancy Air, 200 cubic ft. equal to	*6 tons*
Internal capacity for water up to level of the thwarts	*3½ ,*
Area of delivering tubes	*96 sq. ins.*
Proportion of delivering area to capacity	*1 to 1.25*
Weight of Boat or displacement	*57 Cwt.*
Ballast, water 3 tons, iron keel 5 Cwt.	*65 ,*
Draft of water with 30 men on board	*30 ins.*
N°. of Oars double banked	*10 in N°*
Clench built of Riga wainscot & copper fastened	
Rig of Boat	*none*
Cost complete	*£ 130*



Scale ¼ inch to a foot.

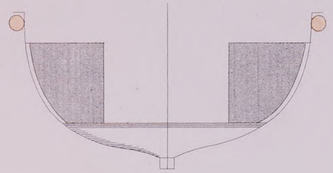
Drawn by Joseph Prowse of H.M. Dockyard, Woolwich, 1851.

Standidge & Co. Litho. Old Jewry.

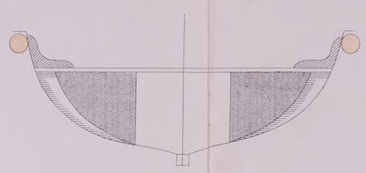
LIFE BOAT, BY GEORGE PALMER, ESQ. NAZING PARK, ESSEX.

Submitted to compete for the Northumberland Premium.

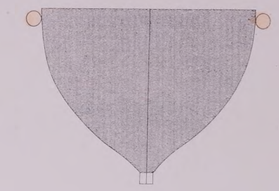
Section at 2.

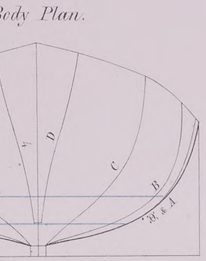


Section at W.



Section at C.

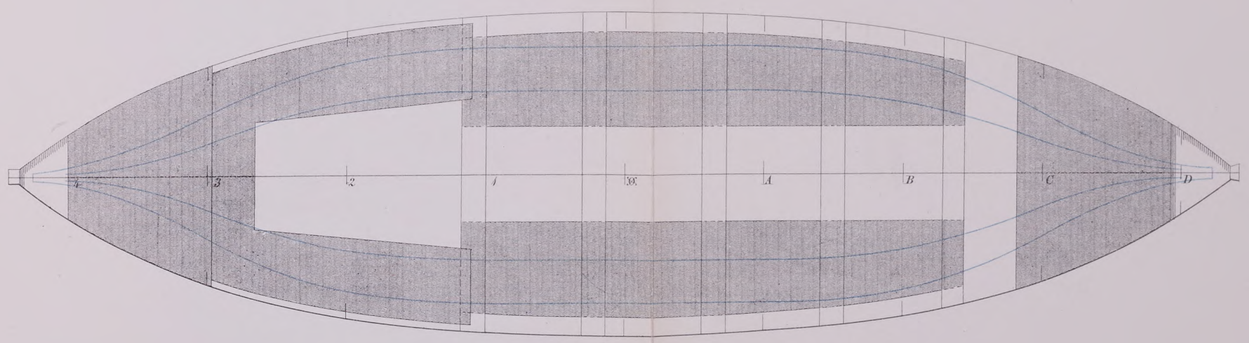




Body Plan.

Sheer Plan.

Plan.



20 15 10 5 0 Scale $\frac{3}{8}$ths inch to a foot.

PRINCIPAL DIMENSIONS.

Length extreme	26 ft.
Length of Keel	24 "
Breadth of Beam	$6\frac{3}{4}$ "
Depth	$3\frac{1}{4}$ "
Sheer of Gunwale	20 ins.
Extra Buoyancy Air, 82 cubic ft. equal to	$2\frac{5}{8}$ tons.
Internal capacity up to the level of the thwarts	$1\frac{1}{2}$ "
Area of delivering valves	none
Proportion of delivering area to capacity	"
Weight of Boat or displacement	45 Cwt.
Ballast	none
Draught of Water with 20 men on board	15 ins.
No of Oars single banked	5
Clench built, of elm & fir, copper fastened	
Rig of Boat	none
Cost complete	£ 75

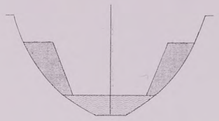
Drawn by Joseph Prowse of H. M. Dockyard, Woolwich, 1851.

Standidge & Co Litho Old Jewry.

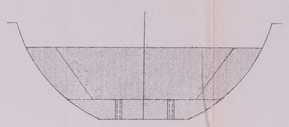
LIFE BOAT, BY WILLEM VAN HOUTEN, ROTTERDAM.

Submitted to compete for the Northumberland Premium.

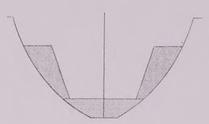
Section at 2.



Section at ℳ.

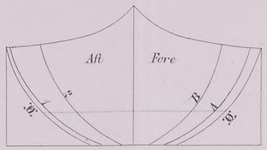


Section at B.

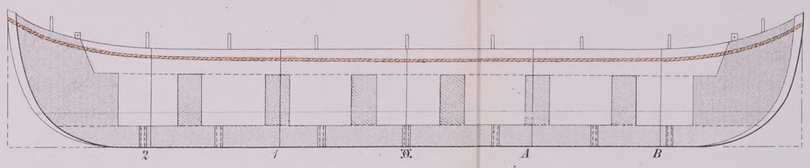


Air

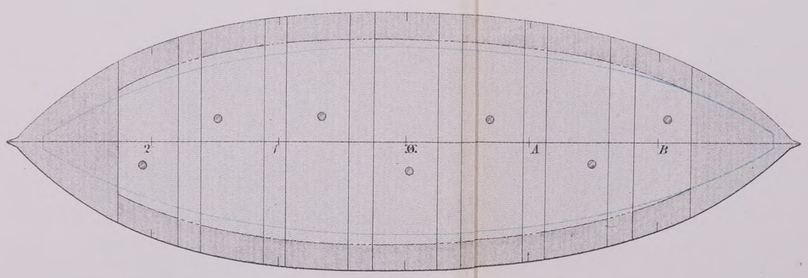
Body Plan



Sheer Plan



Plan



25 20 15 10 5 4 3 2 1 0 *Scale 1 Inch to a Foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*25ft. 0 ins*
Length of Keel or Flat	*19 . 0*
Breadth of Beam	*8 . 0*
Depth	*3 . 0*
Sheer of Gunwale	*1 . 0*
Extra Buoyancy Air 175 cubic ft. equal to	*5 tons*
Internal capacity up to the level of the thwarts	*23*
Area of delivering tubes	*45 sq. ins.*
Proportion of delivering area to capacity	*1 to 1.8*
Weight of Boat or displacement	*20 Cwt*
Ballast	*none*
Draught of Water with 30 men on board	*18 ins.*
№ of Oars single banked	*6*
Clench built of oak & copper fastened	
Rig of Boat	*one lug sail*
Cost complete	*£ 90*

Drawn by Joseph Prowse, of H.M. Dockyard, Woolwich, 1850.

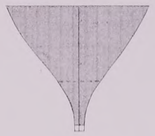
Standidge & Co Lithe Old Jewry.

LIFE BOAT, BY MESSRS WHITE. COWES, ISLE OF WIGHT.

Submitted to compete for the Northumberland Premium.

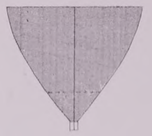
Air

Section at 12

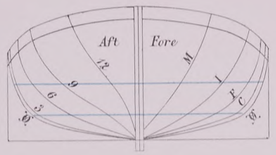


Section at 'O'

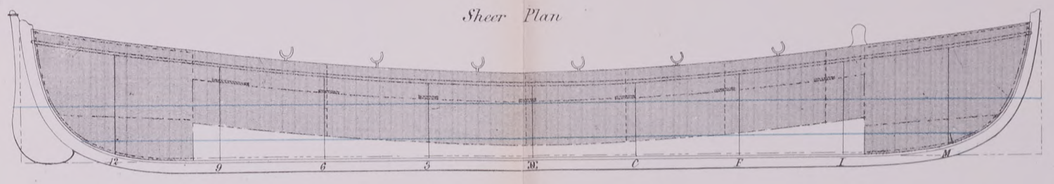
Section at M.



Body Plan



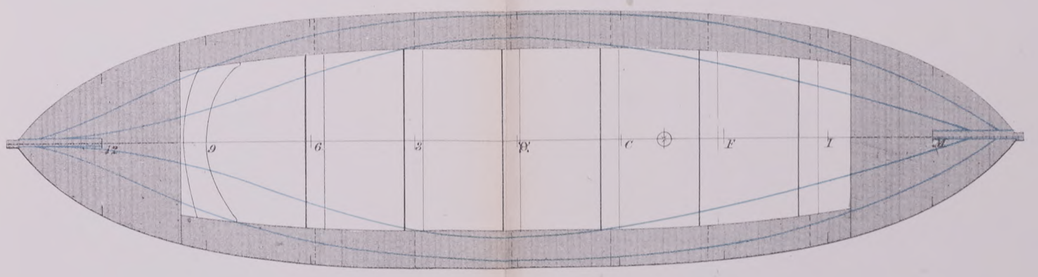
Sheer Plan

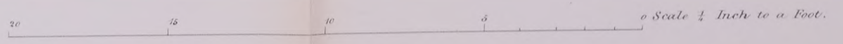


PRINCIPAL DIMENSIONS.

Length extreme	*32 ft. 0 ins.*
Length of Keel	*27 . 0 ,*
Breadth of Beam	*8 . 0 ,*
Depth	*3 . 0 ,*
Sheer of Gunwale	*1 , 6 ,*
Extra Buoyancy. Air 75 Cubic Feet equal to	*2 tons.*
Internal capacity up to the level of the thwarts	*3 ,*
Area of delivering valves	*none*
Proportion of delivering area to capacity	*none*
Weight of Boat or displacement	*30 cwt.*
Ballast	*none*
Draft of water with 30 men on board	*12 ins*
Number of Oars single banked	*6 Oars*
Carvel built of Oak & Copper fastened	
Rig of Boat	*one lugsail*
Cost complete	*£ 75*

Plan





Scale ¼ Inch to a Foot.

Drawn by Joseph Prowse of H.M. Dockyard. Woolwich. 1851.

Standidge & Co. Lithe. Old Jewry

LIFE BOAT BY LIEU.T B, SHARPE, R.N, HANWELL PARK.

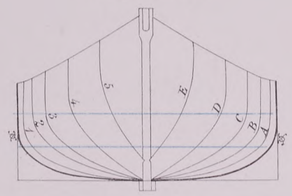
Submitted to compete for the Northumberland Premium.

Cork stationary

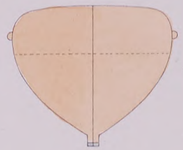
Cork moveable

Iron

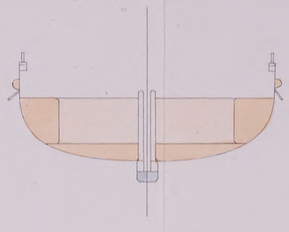
Body Plan.



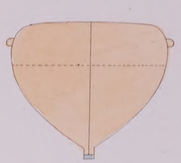
Section at 4



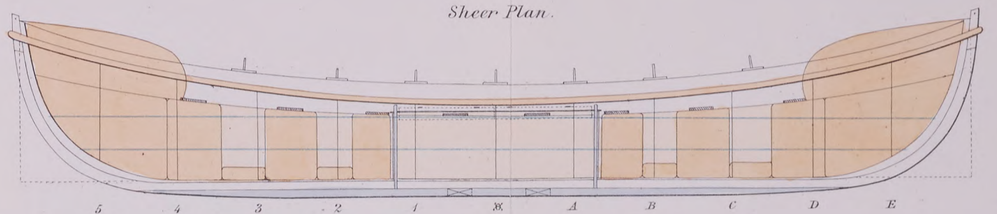
Section at B.



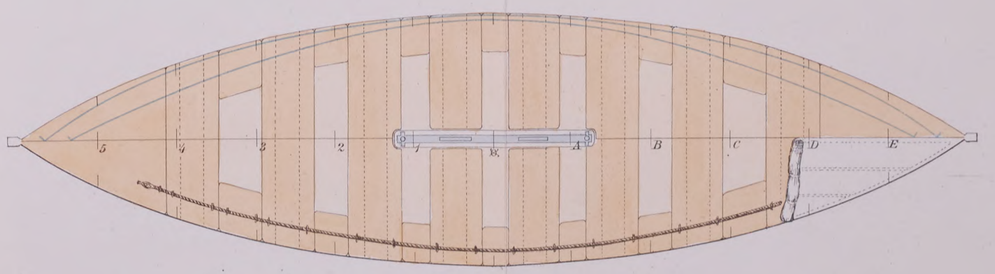
Section at D.



Sheer Plan.



Plan



0 1 2 3 4 5 10 15 20 25 30 *Scale ½ inch to a foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*30 ft. 0 in.*
Length of Keel	*23 . 0 .*
Breadth of Beam	*8 . 0 .*
Depth	*3 . 6 .*
Sheer of Gunwale	*2 . 0 .*
Effective extra bugyancy, Cork 320 cubic ft. equal to	*6¾ tons*
Internal capacity for water up to the level of the thwarts	
Area of discharge	
Proportion of delivering area to capacity	
Weight of Boat or displacement	*25 Cwt*
Ballast, iron keel	*3 "*
Draft of Water with 30 men on board	*2 ft. 0 in.*
N.o of Oars, bow & stroke single, rest double banked	*12*
Clench built of elm & copper fastened.	
Rig of Boat	*one lug sail*
Cost complete	*£ 70*

Drawn by Joseph Prowse of H.M. Dockyard, Woolwich, 1851.

Standidge & Co.rLithe Old Jewry.

LIFE BOAT BY COMMODORE LORD JOHN HAY, C.B.

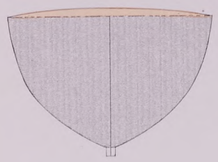
Superintendent of H. M. Dockyard at Devonport.

Air

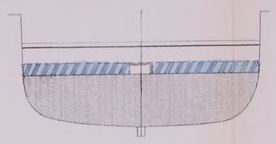
Water course on top of flat

Cork

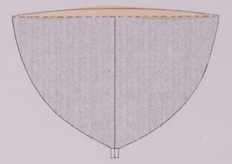
Section at 5



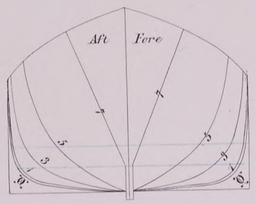
Section at 0



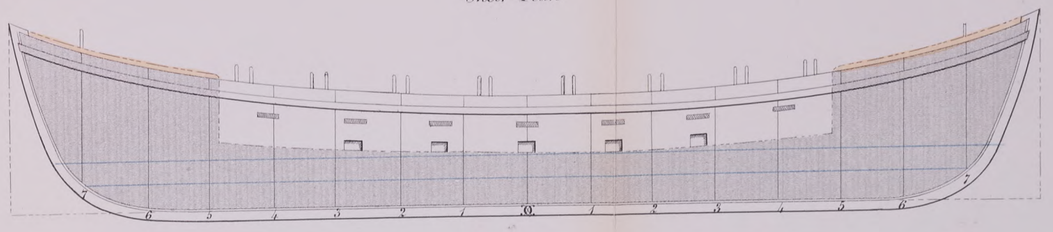
Section at 5.



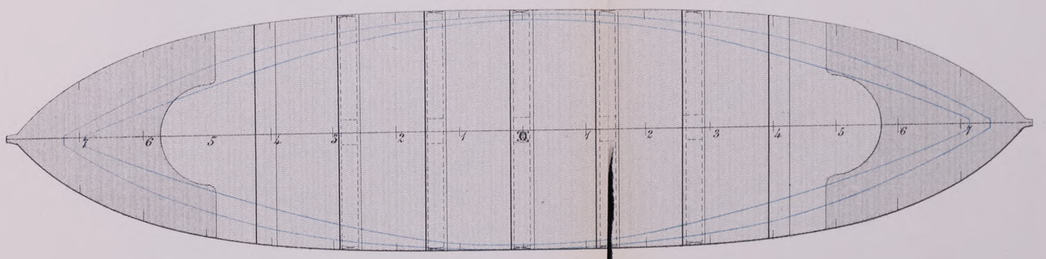
Body Plan.



Sheer Plan



Plan



20 15 10 5 4 3 2 1 0 *Scale ½ Inch to a Foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*32 ft. 8 ins.*
Length of Keel	*26 , 3 ,*
Breadth of Beam	*7 , 6 ,*
Depth to the underside of Keel	*3 , 10*
Sheer of Gunwale	*26*
Extra Buoyancy, Air 419 cubic ft. equal to	*4¼ tons*
Internal capacity up to the level of the thwarts	*4 ,*
Area of delivering Scuppers	*240 Sq. ins.*
Proportion of delivering area to capacity	*A to ·6*
Weight of Boat or displacement	*32 Cwt.*
Ballast	*none*
Draught of Water with 30 men on board	*18 ins.*
N° of Oars double banked	*11 ,*
Built of Fir and Mahogany in narrow strips	
Rig of Boat	
Cost complete	*£ 70*

Drawn by Joseph Prowse of H. M. Dockyard, Woolwich, 1851.

Standidge & Co. Lithe. Old Jewry.

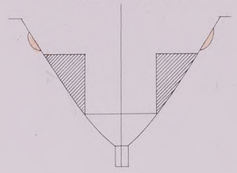
LIFE BOAT, BY THOMAS COSTAIN, LIVERPOOL.

Submitted to compete for the Northumberland Premium.

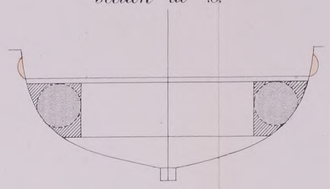
Air

Cork

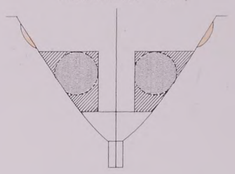
Section at 3.



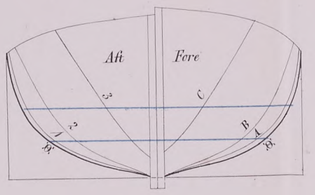
Section at B.



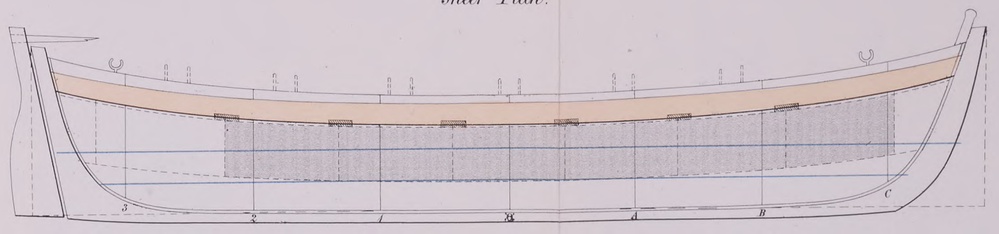
Section at C.



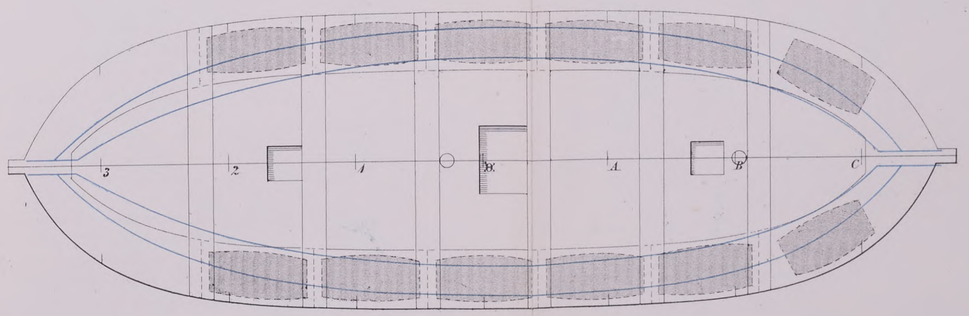
Body Plan.

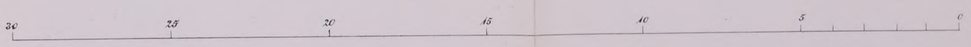


Sheer Plan.



Plan.





PRINCIPAL DIMENSIONS.

Length extreme	30 ft 0 ins
Length of Keel	27 " 0 "
Breadth of Beam	9 " 3 "
Depth	4 " 0 "
Sheer of Gunwale	1 " 6 "
Extra buoyancy, Air 35 cubic feet, equal to	1 ton
Internal capacity up to the level of the thwarts	8½ "
Area of delivering valves	none
Proportion of delivering area to capacity	"
Weight of Boat or displacement	37 Cwt
Ballast	none
Draft of Water with 30 men on board	20 ins
No of Oars double banked	12
Diagonally built, of larch, & copper fastened	
Rig of Boat, 2 spritsails & a jib	
Cost complete	£ 180

Drawn by Joseph Prowse, of H.M. Dockyard, Woolwich, 1851.

Standidge & Co. Litho. Old Jewry

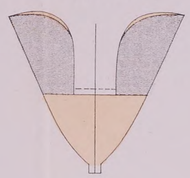
LIFE BOAT, BY JAMES PEAKE, ESQ. WOOLWICH.

Assistant-Master Shipwright in H.M. Dockyard.

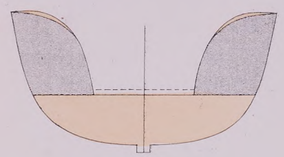
Air

Cork

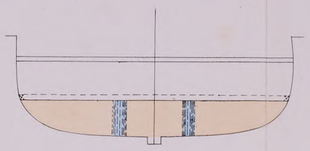
Section at 4.



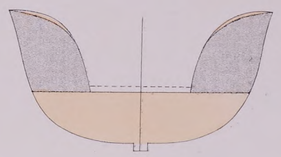
Section at 2.



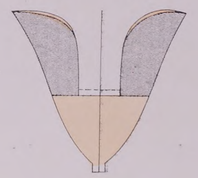
Section at 0.



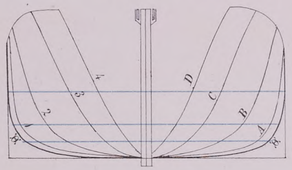
Section at B.



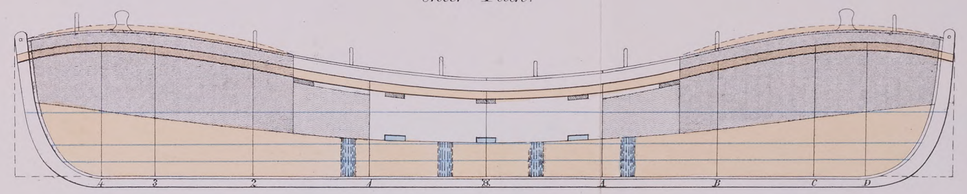
Section at D.



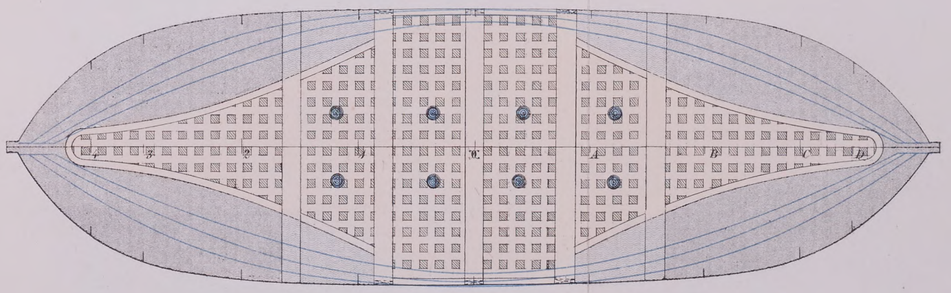
Body Plan.



Sheer Plan.



Plan.



30 25 20 15 10 5 0 *Scale ¼ Inch to a Foot.*

PRINCIPAL DIMENSIONS.

Length extreme	*30 ft 0 ins*
Length of Keel	*24 , 0 ,*
Breadth of Beam	*8 , 9 ,*
Depth to underside of Keel	*3 6 ,*
Sheer of Gunwale	*2 , 4 ,*
Extra buoyancy, Cork & Air, equal to	*3 tons*
Internal capacity up to the level of the thwarts	*4 ,*
Area of delivering valves	*300 sq. ins.*
Proportion of delivering area to capacity	*1 to 5*
Weight of Boat & fittings, or displacement	*38 Cwt.*
Ballast, iron band, equal to	*3 ,*
Draft of Water with 30 men on board	*16 ins.*
No of Oars, double banked	*10*
Diagonal-built of rock elm, & copper fastened	
Rig of Boat, a fore & mizen lug-sail	
Cost complete	*£ 100*

Drawn by Joseph Prowse, of H.M. Dockyard, Woolwich, 1851.

Standidge & Co, Lith.rs Old Jewry.

To accompany a REPORT ON LIFE BOATS.

WRECK CHART
OF THE
BRITISH ISLES
FOR
1850
SHOWING ALSO THE PRESENT
LIFE-BOAT STATIONS.

— • — *each black dot around the coast represents a wreck.*

— ✕ — *on the land represents a life boat.*

In 1850 the whole of the wrecks of British vessels were 692. The wrecks of British and Foreign vessels on the coasts and in the seas of the United Kingdom were 681. Of these 277 were total wrecks; Sunk by leaks or collisions 84, Stranded and damaged so as to require to discharge cargo 304; Abandoned 16.— Total wrecks &c 681.— Total lives lost 784.

There are 75 life boats in England.
" " 8 " " " Scotland.
" " 8 " " " Ireland.
About one half of the boats are unserviceable.

The list of wrecks compiled by J.J. Shillingflaw ——— Printed by Standidge & Co Old Jewry.

Engraved on Stone by A. Petermann. Camden St (N) Camden Town.